SITE HEALTH AND SAFETY PLAN (HASP)

Office: CHI

Site Name: Lusher Street Groundwater Contamination Site

Client: U.S. EPA

Work Location: Elkhart, Elkhart County, Indiana

WO#: 20405.012.008.0506.00

SITE HEALTH AND SAFETY PLAN (HASP)								
Prepared by: Tre	nna Seilheimer		W.O. Number	: 20405.012.008.05	06.00	Date: 9-24-08		
Project Identificat				Site History: USE	PA has requeste	ed that Weston		
	sher Street Grou S. EPA	indwater Contamina	result several facilities will be investigated to check for soil and groundwater VOC contamination. Potential			art, Indiana. As a igated to check for nation. Potential		
0	contaminants of concern are expected to be VOCs.							
Scope of Work: At each facility soil	and groundwate	er samples will be c	ollected using	Geoprobe.				
Clear each drillin Underground Plant		the presence of u	underground	utilities through Ind	liana's one-call	system (Indiana		
utilizing a track-n	nounted Geopre	be® or equivaler	nt. Soil sam	to an estimated 25 oples will be collectable-screen sampli	ted from each			
		ifferent facilities to samples will be colle		25 feet bgs utilizing ch location.	g a track-mounte	ed Geoprobe® or		
		waste (IDW), including tamination and well		nal protective equipities.	oment (PPE), s	oil cuttings, and		
☐ Site visit only;	site HASP not ne	ecessary. List pers	onnel here an	d sign off below:				
		Reg	gulatory Sta	tus:				
Site regulatory status CERCLA/SARA		r Federal Agency	Based on the H	Manual (Required to bazard Assessment and Re	egulatory Status, dete			
☑ U.S. EPA	☐ U.S. EPA	☐ DOE		able to this project. Indica nd the appropriate pages o				
☐ State	☐ State	USACE	☐ Stack Tes					
☐ NPL Site	NRC	☐ Air Force	☐ Air Emissi	ons				
⊠ OSHA	☐ 10 CFR 20	П	☐ Asbestos		□			
Hazard Communicat	tion (Req'd See Att 1926 🔲 S		Industrial	Hygiene –		<u> </u>		
		Review and A	Approval Do	cumentation:				
Reviewed by:			1.1.					
SO/DSM/CHS	Tonya Balla				Date:			
	Name (Print)			Signature				
Other					Date:			
	Name (Print)			Signature				
Approved by:								
Project Manager	Omprakash Pa	atel		0:	Date:	<u> </u>		
	Name (Print)			Signature				
				ipment Selection:				
				ram and 29 CFR 19				
				evaluated conditions ate for the hazards k				
		Personal Protectio			o or oxpoore	a to oxion (i toro.		
⊠FSO								
⊠ Site Manager		Trenna Seilheimer			Date	:		
	_	Name		Signature				
	Compliance			-				
Officer	de Obliganta							
☐ Dangerous Good Coordinator	as Snipping	Tonya Balla						

1	Name	Signature	
Project start date: November 2008	This site HASP must be	Amendment date(s)	By:
	reissued/reapproved for any	1.	·
End date: April 2009	activities conducted after:	2.	
	Date:	4.	
		5.	

Vehicle Use Assessment and Selection
Driving is one of the most hazardous and frequent activities for WESTON Employees. The most appropriate type vehicle(s) authorized for use on this project is/are:
1. SUV
2.
3. 4.
T.
The following Project Team Member's qualifications and experience in driving these types of vehicles was evaluated and
found to be acceptable (indicate vehicle type(s) number next to employee name). 1. Trenna Seilheimer
2. TBD
3. TBD 4. TBD
5.
6.
7. 8.
9.
10.
The project site was evaluated and a Traffic Control Plan ☐ is required ☒ is not required.
The project one mae evaluated and a frame control fram [] to required [2] to not required.
If required, the Traffic Control Plan can be found in Attachment H.

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	7.1 TRAINING AND BRIEFING TOPICS	
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	TACHMENT A CHEMICAL CONTAMINANTS DATA SHEETS	
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,		

1. PERSONNEL ON SITE INFORMATION	

		N REPRESENTATIVES	
Organization/Branch	Name/Title	Address	Telephone
VHI	Omprakash Patel	750 E Bunker Court	847.918.4051
	Project Manager	Suite 500	
		Vernon Hills, IL 60061	
CHI	Trenna Seilheimer	20 N Wacker Drive	312.424.3314
	Associate Geoscientist	Suite 1210	
		Chicago, IL 60606	
CHI/VHI	TBD		
CHI/VHI	TBD		
	: O. Patel- Project Manager and t	he Task Manager for this job.	
Roles and Responsibilities T. Seilheimer- FSO and FTL be responsible for assuring t	FSO will assure that the underg hat the underground utilities are m	round utilities are marked prior to beg arked).	Jinning boring activities (contractors w
Roles and Responsibilities T. Seilheimer- FSO and FTL be responsible for assuring t Unknown- Alternate FTL	FSO will assure that the underghat the underground utilities are m	round utilities are marked prior to begarked).	
Roles and Responsibilities T. Seilheimer- FSO and FTL be responsible for assuring t Unknown- Alternate FTL Organization/Branch Cabeno Environmental	FSO will assure that the underg hat the underground utilities are m	round utilities are marked prior to beg arked).	Jinning boring activities (contractors was a second or s
Roles and Responsibilities T. Seilheimer- FSO and FTL be responsible for assuring t Unknown- Alternate FTL	FSO will assure that the underghat the underground utilities are m 1.2 WESTON Name/Title	round utilities are marked prior to begarked). N SUBCONTRACTORS Address 16714 Cherry Creek Court	Telephone

The Site Field Safety Officer (FSO) for activities to be conducted at this site is: <u>Trenna Seilheimer</u>

The FSO has total responsibility for ensuring that the provisions of this Site HASP are adequate and implemented in the field.

Changing field conditions may require decisions to be made concerning adequate protection programs. Therefore, the personnel assigned as FSOs are experienced and meet the additional training requirements specified by OSHA in 29 CFR 1910.120.

Qualifications:

First Aid/CPR; 40-hour/refresher; Medical; FSO; Dangerous Goods Shipping

Designated alternates include:

1.3 SITE PERSONNEL AND CERTIFICATION STATUS							
1.3.1 Weston Employee Certification							
Name: Trenna Seilheimer	Name: Trenna Seilheimer Name:						
Title: Associate Geoscientist		Title:					
Task(s): All		Task(s):					
Certification Level or Description:		Certification Level or Descri	ption:				
Medical Current	Training Current	Medical Current	Training Current				
Fit Test Current (Qual.)	Fit Test Current (Quant.)	Fit Test Current (Qual.)	Fit Test Current (Quant.)				
Name:		Name:					
Title:		Title:					
Task(s):		Task(s):					
Certification Level or Description:	_	Certification Level or Descri	ption:				
Medical Current	Training Current	Medical Current	Training Current				
Fit Test Current (Qual.)	Fit Test Current (Quant.)	Fit Test Current (Qual.)	Fit Test Current (Quant.)				
Name:		Name:					
Title:		Title:					
Task(s):		Task(s):					
Certification Level or Description:		Certification Level or Description:					
Medical Current	Training Current	Medical Current	Training Current				
Fit Test Current (Qual.)	Fit Test Current (Quant.)	Fit Test Current (Qual.)	Fit Test Current (Quant.)				
Name:		Name:					
Title:		Title:					
Task(s):		Task(s):					
Certification Level or Description:	_	Certification Level or Description:					
Medical Current	Training Current	Medical Current	Training Current				
Fit Test Current (Qual.)	Fit Test Current (Quant.)	Fit Test Current (Qual.)	Fit Test Current (Quant.)				
Name:		Name:					
Title:		Title:					
Task(s):		Task(s):					
Certification Level or Description:		Certification Level or Description:					
Medical Current	Training Current	Medical Current	Training Current				
Fit Test Current (Qual.)	Fit Test Current (Quant.)	Fit Test Current (Qual.)	Fit Test Current (Quant.)				
Name:		Name:					
Title:		Title:					
Task(s):		Task(s):					
Certification Level or Description:	_	Certification Level or Descri	ption:				
Medical Current	Training Current	Medical Current	Training Current				
Fit Test Current (Qual.)	Fit Test Current (Quant.)	Fit Test Current (Qual.)	Fit Test Current (Quant.)				

TRAINING CURRENT - Training: All personnel, including visitors, entering the exclusion or contamination reduction zones must have certifications of completion of training in accordance with OSHA 29 CFR 1910, 29 CFR 1926, or 29 CFR 1910.120.

FIT TEST CURRENT - Respirator Fit Testing: All persons, including visitors, entering any area requiring the use or potential use of any negative pressure respirator must have had, as a minimum, a qualitative fit test, administered in accordance with OSHA 29 CFR 1910.134 or ANSI, within the last 12 months. If site conditions require the use of a full-face, negative-pressure, air-purifying respirator for protection from asbestos or lead, employees must have had a qualitative fit test, administered according to OSHA 29 CFR 1910.1001 or 1025/1926, within the last 6 months.

MEDICAL CURRENT - Medical Monitoring Requirements: All personnel, including visitors, entering the exclusion or contamination reduction zones must be certified as medically fit to work and to wear a respirator, if appropriate, in accordance with 29 CFR 1910, 29 CFR 1926/1910, or 29 CFR 1910.120.

The Site Field Safety Officer is responsible for verifying all certifications and fit tests.

SITE PERSONNEL AND CERTIFICATION STATUS								
1.3.2 Subcontractor's Health and Safety Program Evaluation								
Name of Subcontractor: Cabeno Environmental Services								
Address: 16714 Cherry Creek Court, Joliet, Illinois 60433								
Activities To Be Conducted by Subcon	tractor:							
	Evaluation C	Criteria						
Medical program meets OSHA/WESTON Personal protective equipment available On-site monitoring equipment available calibrated, and operated properly								
Acceptable	Acceptable		Acceptable					
Unacceptable	Unacceptable		Unacceptable					
Comments:	Comments:		Comments:					
Safe working procedures clearly specified	Training meets OSHA/WE	STON criteria	Emergency procedures					
Acceptable	Acceptable		Acceptable					
Unacceptable	Unacceptable		Unacceptable					
Comments:								
Decontamination procedures	General health and safety evaluation	program	Additional comments:					
Acceptable	Acceptable		Subcontractor has agreed to and will conform with the WESTON HASP for					
Unacceptable	Unacceptable		this project.					
Comments:	Comments:		Subcontractor will work under his own HASP, which has been accepted by project PM.					
Evaluation Conducted by: Certifications added to the HASP prior to beginning wor	s for all subcontractors per k.	rsonnel will be	Date:					
	Subcontra	actor						
Name:		Name:						
Title:		Title:						
Task(s):		Task(s):						
Certification Level or Description:		Certification Level or Description:						
	Medical CurrentTraining CurrentMedical Curren							
	Fit Test Current (Quant.)	Fit Test Current (C	Qual.) Fit Test Current (Quant.)					
Name: Title:		Name: Title:						
Task(s):								
Certification Level or Description: Certification Level or Description:								
	Training Current	Medical Current	Training Current					
Fit Test Current (Qual.) Fit Test Current (Qual.) Fit Test Current (Qual.) Fit Test Current (Qual.)								

2. HEALTH AND SAFETY EVALUATION

2.1 HEALTH AND SAFETY EVALUATION								
2.1.1 Task Hazard Assessment								
Background Review: ⊠ Complete ☐ Partial If partial why?								
Activities Covered Under This Plan:								
No.	·						Schedule	
Soil Boring Soil borings and temporary monitoring well will be advanced to specific depths. Soil samples will be collected by a Geoprobe. Groundwater samples will also be collected if conditions are suitable for retractable-screen sampling methods (boring locations). A bladder pump or bailer will be used to collect groundwater samples from temporary monitoring wells.						3 weeks		
Numbers re	Types of Hazards: Numbers refer to one of the following hazard evaluation forms. Complete hazard evaluation forms for each appropriate hazard class.							
Physioche	mical 1	Chemical	ly Toxic 1		Radiation 3	Biological	2	
			lonizing:	☐ Etiological Agent				
 ☐ Explosi	ve				☐ Internal exposure	☐ Other (plant, insect, animal)		
☐ Corrosi		□ Contact	_	n	External exposure			
☐ Reactiv	e		_		·			
☐ O₂ Rich☐ O₂ Defi		_	1910.1000 Substance ontaminants)					
	 ✓ OSHA Specific Hazard Substance Standard (Refer to following page for listing) ✓ RF							
		Source/Lo	cation of Contami	nan	ts and Hazardous Sub	stances:		
Directly Re	elated to Tasl	ks	Indirectly Relat Members:	ted t	to Tasks — Nearby Proce	ss(es) That	Could Affect Team	
☐ Other S	Surface		☐ Client Facilit	ty/W	ESTON Work Location			
☐ Groundwater ☐ Nearby Non-Client Facility								
Soil			Describe:					
□□□ Surface	e Water							
	y Wastewater		☐ Have activiti	ies (1	task[s]) been coordinated v	vith facility?		
	s Wastewater							
Other								

HEALTH AND SAFETY EVALUATION							
2.1.2 Chemical Hazards of Concern							
□ N/A							
Chemical Contaminants of Concern Provide the data requested for chemica from an acceptable source such as NIO TLV booklet, etc. List chemicals and co B of this HASP.	SH pocket guide, condensed chemi	cal dictionary, ACGIH	Identify hazardous materials used or on-site and attach Material Safety Data Sheets (MSDSs) for all reagent type chemicals, solutions, or other identified materials that in normal use in performing tasks related to this project could produce hazardous substances. Ensure that all subcontractors and other parties working nearby are informed of the presence of these chemicals and the location of the MSDSs. Obtain from subcontractors and other parties, lists of the hazardous materials they use or have on-site and identify location of the MSDSs here. List chemicals and quantities below and locate MSDSs in Attachment B of this HASP.				
Chemical	Name	Concentration ()	Chemical Name		Quantity		
PCE		110 ppb	Alconox		Small amounts		
TCE	TCE		Nitric Acid (as preservative in sample bottles)		Small amounts		
TCA		1 ppb	Isobutylene calibration gas		100 ppm		
			Hydrochloric acid (as preservative)		Small amounts		
	OSH	A SDECIEIC HAZA	PROUS SUBSTANCES				
	OSHA-SPECIFIC HAZARDOUS SUBSTANCES The following substances may require specific medical, training, or monitoring based on concentration or evaluation of risk. See the appropriate citation listed under 29 CFR 1910 or 1926 for additional information.						
1910.1001 Asbestos	1910.1002 Coal tar pitch vola	tiles 19	10.1003 4-Nitrobiphenyl, etc.	1910.1004 alpha-Naphthy	/lamine		
1910.1005 [Reserved]	1910.1006 Methyl chlorometh	yl ether 19	10.1007 3,3'-Dichlorobenzidine (and its salts)	1910.1008 bis-Chloromet	hyl ether		
1910.1009 beta-Naphthylamine	1910.1010 Benzidine	<u> </u>	10.1011 4-Aminodiphenyl	1910.1012 Ethyleneimine			
1910.1013 beta-Propiolactone	1910.1014 2-Acetylaminofluo	rene 🗌 19	1910.1015 4-Dimethylaminoazobenzene 🔲 1910.1016 N-Nitrosodin		thylamine		
1910.1017 Vinyl chloride	1910.1018 Inorganic arsenic	<u> </u>	10.1025 Lead (Att. FLD# 46)	1910.1027 Cadmium			
1910.1028 Benzene	1910.1029 Coke oven emission	ons	10.1043 Cotton dust	1910.1044 1,2-Dibromo-3	-chloropropane		
1910.1045 Acrylonitrile	1910.1047 Ethylene oxide	<u> </u>	10.1048 Formaldehyde	1910.1050 Methylenedian	niline		
1910.1051 1,3 Butadiene	1910.1052 Methylene chloride	е					

HEALTH AND SAFETY EVALUATION							
2.1.3 Biological Hazards of Concern							
Poisonous Plants (FLD 43)		Insects (FLD 43)					
Location/Task No(s).:		Location/Task No(s).:					
Source:	Suspect	Source:	Known	Suspect			
Route of Exposure:	☐ Ingestion☐ Direct Penetration	Route of Exposure:	Inhalation Contact	☐ Ingestion ☐ Direct Penetration			
Team Member(s) Allergic: Immunization required:	` '	Team Member(s) Allergic: Yes No Immunization required: Yes No					
Snakes, Reptiles (FLD 43)		Animals (FLD 43)					
Location/Task No(s).: Source:	SuspectIngestionDirect Penetration	Location/Task No(s).: Source: Route of Exposure:	☐ Known ☐ Inhalation ☐ Contact	Suspect Ingestion Direct Penetration			
Team Member(s) Allergic: Immunization required:	☐ Yes ☐ No ☐ Yes ☐ No	Team Member(s) Allergic: Yes No Immunization required: Yes No					
FLD 43 — WESTON Biohazard Fi	eld Operating Procedure	s: Att. OP					
☐ Sewage		Etiologic Agents (List)					
Location/Task No(s).: Source:	Suspect Ingestion Direct Penetration	Location/Task No(s).: Source: Route of Exposure:	☐ Known ☐ Inhalation	Suspect			
Contact Team Member(s) Allergic: Immunization required:	Contact Direct Penetration Team Member(s) Allergic: Yes No Immunization required: Yes No						
Tetanus Vaccination within Past 10	yrs: Yes No						
FLD 44 — WESTON Bloodborne F	Pathogens Exposure Cor	ntrol Plan – First Aid Pro	ocedures: Att	. OP 🛚			
FLD 45 — WESTON Bloodborne Pathogens Exposure Control Plan – Working with Infectious Waste: Att. OP							

	HEALTH AND SAFETY EVALUATION									
	2.1.4 Radiation Hazards of Concern									
	NONIONIZING RADIATION									
Task No.	Type of Nonionizing Radiation	Source C	On-Site	TLV/	PEL	Wav Rang	elength ge	Control Measures	Monitoring Inst	rument
1	Ultraviolet	Solar						Appropriate clothing/ sunscreen	None	
	Infrared	N/A								
	Radio Frequency	N/A								
	Microwave	N/A								
	Laser	N/A								
					IONIZING	RADIAT	ION			
					DAC (µCii/m					
Task No.	Radionuclide	Major Radiations	Radioactiv Half-Life (Years)	ve	D	w		Y	Surface Contamination Limit	Monitoring Instrument

HEALTH AND SAFETY EVALUATION

2.1.5 Physical Hazards of Concern

Physical Hazard Condition	Physical Hazard	Attach	WESTON OP Titles	
Loud noise	Hearing loss/disruption of communication	OP 🖂	Section 7.0 - ECH&S Program Manual Occupational Noise	
Inclement weather			& HC Program FLD02 - Inclement Weather	
	Rain/humidity/cold/ice/snow/lightning		FLD02 - Incernent weather FLD03 - Hot Process - Steam	
Steam heat stress	Burns/displaced oxygen/wet working surfaces	ᅡ片		
Heat stress	Burns/hot surfaces/low pressure steam	+H	FLD04 - Hot Process - LT3	
Ambient heat stress	Heat rash/cramps/exhaustion/heat stroke		FLD05 - Heat Stress Prevention/Monitoring	
Cold stress	Hypothermia/frostbite		FLD06 - Cold Stress	
Cold/wet	Trench/paddy/immersion foot/edema		FLD02 - Inclement Weather	
Confined spaces	Falls/burns/drowning/engulfment/electrocution	\dashv	FLD08 - Confined Space Entry	
Industrial Trucks	Fork Lift Truck Safety		FLD09 – Powered Industrial Trucks	
Improper lifting	Back strain/abdomen/arm/leg muscle/joint injury		FLD10 - Manual Lifting/Handling Heavy Objects	
Uneven surfaces	Vehicle accidents/slips/trips/falls		FLD11 - Rough Terrain	
Poor housekeeping	Slips/trips/falls/punctures/cuts/fires		FLD12 - Housekeeping	
Structural integrity	Crushing/overhead hazards/compromised floors		FLD13 - Structural Integrity	
Hostile persons	Bodily injury		FLD14 - Site Security	
Improper cylinder. handling	Mechanical injury/fire/explosion/suffocation		FLD16 - Pressure Systems - Compressed Gases	
Water hazards	Poor visibility/entanglement/drowning/cold stress		FLD17 - Diving	
Water hazards	Drowning/heat/cold stress/hypothermia/falls		FLD18 - Operation and Use of Boats	
Water hazards	Drowning/frostbite/hypothermia/falls/electrocution		FLD19 - Working Over Water	
Vehicle hazards	Struck by vehicle/collision		FLD20 - Traffic	
Explosions	Explosion/fire/thermal burns		FLD21 - Explosives	
Moving mechanical parts	Crushing/pinch points/overhead hazards/electrocution		FLD22 – Earth Moving Equipment	
Moving mech. parts	Overhead hazards/electrocution		FLD23 – Cranes, Rigging, and Slings	
Working at elevation	Overhead hazards/falls/electrocution		FLD24 - Aerial Lifts/Man lifts	
Working at elevation	Overhead hazards/falls/electrocution		FLD25 - Working at Elevation	
Working at elevation	Overhead hazards/falls/electrocution/slips		FLD26 - Ladders	
Working at elevation	Slips/trips/falls/overhead hazards		FLD27 - Scaffolding	
Trench cave-in	Crushing/falling/overhead hazards/suffocation		FLD28 - Excavating/Trenching	
Physiochemical	Explosions/fires from oxidizing, flam./corr. material		FLD30 - Hazardous Materials Use/Storage	
Physiochemical	Fire and explosion		FLD31 - Fire Prevention/Response Plan Required	
Physiochemical	Fire	\boxtimes	FLD32 - Fire Extinguishers Required	
Structural integrity	Overhead/electrocution/slips/trips/falls/fire		FLD33 - Demolition	
Electrical	Electrocution/shock/thermal burns		FLD34 - Utilities	
Electrical	Electrocution/shock/thermal burns		FLD35 - Electrical Safety	
Burns/fires	Heat stress/fires/burns		FLD36 - Welding/Cutting/Brazing/Radiography	
Impact/thermal	Thermal burns/high pressure impaction/heat stress		FLD37 - Pressure Washers/Sand Blasting	
Impaction/electrical	Smashing body parts/pinching/cuts/electrocution		FLD38 - Hand and Power Tools	
Poor visibility	Slips/trips/falls		FLD39 - Illumination	
Fire/explosion	Burns/impaction		FLD40 - Storage Tank Removal/Decommissioning	
Communications	Disruption of communications		FLD41 - Std. Hand/Emergency Signals	
Energy/release	Unexpected release of energy		FLD42 - Lockout/Tag-out	
Biological Hazards	Biological Hazards at site		FLD43 - Biological Hazards	
Biological Hazards/BBP	Biological Hazards/BBP at site/First Aid Providers		FLD44 - Biological Hazards – Bloodborne Pathogens Exposure Control Plan – First Aid Providers	
Infectious Waste	Infectious Waste at site/BBP/ at site/Infectious Waste		FLD45 – Biological Hazards – Bloodborne Pathogens Exposure Control Plan – Work With Infectious Waste	
Lead Contaminated sites	Lead poisoning		FLD46 - Control of Exposure to Lead	
Puncture/cuts	Cuts/ dismemberment/gouges		FLD47 - Clearing, Grubbing and Logging Operations	

2.1.5 Physical Hazards of Concern (Continued)						
Physical Hazard Condition	Physical Hazard	Attach OP	WESTON OP Titles			
Not applicable	Not applicable		FLD48 – Federal, State, Local Regulatory Agency Inspections			
Not applicable	Exposure to hazardous materials/waste		FLD49 – Safe Storage of Samples			
Cadmium	Exposure Control		FLD50 – Cadmium Exposure Control Plan			
Process Safety Procedure	Safety Procedure		FLD51 – Process Safety Procedure			
Asbestos	Asbestos Exposure		FLD52 – Asbestos Exposure Control Plan			
Hexavalent Chromium	Exposure Control Plan		FLD53 – Hexavalent Chromium Exposure Control Plan			
Benzene	Exposure Control Plan		FLD54 - Benzene Exposure Control Plan			
Hydrofluoric acid	Working with HF		FLD55 – Working with Hydrofluoric Acid			
Moving drill rig parts	Crushing/pinch points/overhead hazards/electrocution		FLD56 – Drilling Safety			
Vehicles/driving	Accidents,/fatigue/cell phone use		FLD 57 – Motor Vehicle Safety			
Improper material handling	Back injury/crushing from load shifts/equipment/tools		FLD 58 – Drum Handling Operations			
COC decontamination	COCs/slip,trip, and falls/waste generation/environmental compliance/PPE		FLD59 - Decontamination			
Drilling hazards	Electrocution/overhead hazards/pinch points		Environmental Remediation Drilling Safety Guideline - 2005			
Fatigue	Long work hours	\boxtimes	FLD60 – Employee Duty Schedule			
Benzene/Gasoline	Benzene exposure		FLD61 – Gasoline Contaminant Exposure			

3. TASK BY TASK ASSESMENT	

3.1 TASK-BY-TASK RISK ASSESSMENT
3.1.1 Task 1 Description
TASK 1:
Soil borings and temporary monitoring wells will be advanced to specific depths. Soil samples will be collected by a Geoprobe. Groundwater samples will also be collected if conditions are suitable for retractable-screen sampling methods (boring locations). A bladder pump or bailer will be used to collect groundwater samples from temporary monitoring wells.
EQUIPMENT REQUIRED/USED
Geoprobe unit, bladder pump, bailers, tubing, water quality meters, water level indicator, sample containers, Multi-Rae, modified level D PPE, hand tools, reflective safety vests, and traffic cones.
POTENTIAL HAZARDS/RISKS
Chemical
☐ Hazard Present Risk Level: ☐ H ☐ M ☐ L What justifies risk level? Potential contaminants of concern are expected to be VOCs.
Physical
☐ Hazard Present Risk Level: ☐ H ☐ M ☐ L
What justifies risk level? Hazards associated with the Geoprobe - adherence to SOPs; working around moving parts of rig and with hand tools; when operating and particularly while pulling the probe or when the probe encounters different consistency soils or the Geoprobe is used through asphalt or concrete, has both hydraulic and kinetic (gravity) stored hazardous energy; all appropriate guards must be in place; coupling between the rig and probe must be heavy duty; only qualified operators will be near the rig when probes are being pushed; non-operators stay away, at least 15 feet, from the rear of the rig during operation; pinch hazard between the probe and the drive head; appropriate precautions, primarily awareness, guarding, if possible, and training are essential to prevent pinching. Weather related hazards/concerns - adherence to SOPs will minimize the risk; take frequent warm-up breaks if cold/windy weather. Overhead/Underground utilities - proper areas need to be marked prior to beginning borings and need to be rechecked with onsite personnel; check with contractor to assure the information and utilities are marked; minimum of two methods will be utilized to confirm the location of utilities; drilling locations will be cleared by JULIE and private utility locator. Illumination - all work is scheduled to be conducted in the daylight hours; however, proper illumination will be adhered to if access is denied during the day time.
Biological
Hazard Present What justifies risk level? Insects, plants, and animals are expected to be minimal. General awareness/avoidance and required PPE should address the hazards. If allergies are a factor, be aware of the surroundings and the plant life.
RADIOLOGICAL Hazard Present Risk Level: H M L
What justifies risk level? None anticipated except for solar radiation.
LEVELS OF PROTECTION/JUSTIFICATION
Level D Cones and reflective safety vests will be used
SAFETY PROCEDURES REQUIRED AND/OR FIELD OPS UTILIZED
All work will be performed in accordance with the provisions of this HASP, OSHA guidelines, and WESTON Standard Operating Procedures.

		3.2 PERSONNEL F	PROTECTION PLAN					
Engineering Controls Describe Engineering Controls used as part of Personnel Protection Plan:								
Task(s) All All All								
	Administrative Controls Describe Administrative Controls used as part of Personnel Protection Plan:							
Task(s) All Distance will be maintained from drilling equipment whenever possible. Follow the safety regulations for the use of the Geoprobe as developed by the manufacturer of the rig and the contractor/subcontractor's safety group. All Inspection of the drill rig prior to initiation of work. Training for use of equipment and work around hazardous materials. Personal Protective Equipment Action Levels for Changing Levels of Protection. Refer to HASP Form 13, Site Air Monitoring Program—Action Levels. Define Action Levels for up or down grade for eactask: Task(s) All Drilling, soil, and groundwater sampling = Level D PPE All Reflective safety vests may be worn in areas of parking lots								
		Description of Le	vels of Protection					
	Level D)	Level D Modified					
Task(s): 1			Task(s):					
		Hard hat	☐ Head					
⊠ Eye an	d Face	Safety glasses	☐ Eye and Face					
☐ Hearing Ear plugs		Ear plugs	☐ Hearing					
☐ Arms and Legs Only			☐ Arms and Legs Only					
		Warm clothing	☐ Whole Body					
		Work gloves/nitriles	☐ Apron					
⊠ Foot -	Safety Boots	Steel-toed boots	☐ Hand - Gloves					
│ │ │ Fall Pr	otection		☐ Gloves					
☐ Flotation	on		☐ Gloves					
☐ Other		Reflective safety vest	☐ Foot - Safety Boots					
		•	☐ Over Boots					



4.1 SITE OR PROJECT HAZARD MONITORING PROGRAM								
4.1.1 Air Monitoring Instruments								
Instrument Selection and Initial Check Reco Reporting Format: ⊠ Field Notebook ☐ Fi		Sheets* □	Air Monitor	ina Loa 🗆	Trip Report ☐ Other			
	Task	Number	Number	Checked Upon				
Instrument	No.(s)	Required	Received	Receipt	Comment	Initials		
□ cgi								
□ O ₂								
☐ CGI/O ₂								
⊠ CGI/O₂/tox-PPM, H₂S,H₂S/CO (MultiRae)								
□RAD								
GM (Pancake)								
☐ NaI (Micro R)								
ZnS (Alpha Scintillator)								
☐ Other								
☐ PID								
☐ HNu 10.2								
☐ HNu 11.7								
☐ Photovac, TMA								
□о∨м								
☐ Other								
□ FID								
☐ Fox 128								
☐ Heath, AID, Other								
RAM, Mini-RAM, Other								
☐ Monitox								
Specify:								
Personal Sampling								
Specify:								
☐ Bio-Aerosol Monitor								
☐ Pump - MSA, Dräeger, Sensidyne								
☐ Tubes/type:								
☐ Tubes/type:								
Other								

4.1	4.1 SITE OR PROJECT HAZARD MONITORING PROGRAM							
	4.	1.2 Air	Monitorin	ng Instrum	nents Cali	bration Reco	rd	
Instrument, Mfg., Model, Equip. ID No.	Date	Time	Calib. Material	Calib. Method Mfg.'s	Other	Initial Setting and Reading	Final Setting and Reading	Calibrator's Initials

4.2 SITE AIR MONITORING PROGRAM

Action Levels

These Action Levels, if not defined by regulation, are some percent (usually 50%) of the applicable PEL/TLV/REL. That number must also be adjusted to account for instrument response factors.

Consider toxic		Tasks	Action	Level	Action
Consider toxic Work may con Increase moni frequency. >25% LEL >10% LEL Work must sto area before re Ambient Air Confined Space Concentration <19.5% O₂ 19.5% O₂ 19.5% O₂ 19.5% to 23.5% O₂ Work may con Investigate ch 21%. >25% O₂ >23.5% O₂ Work must sto area before re Work may con Investigate ch 21%. >25% O₂ >23.5% O₂ Work must sto area before re Concentration Continue work Radiation abo background to Continue work Radiation abo background Investigate ch 21%. >25% O₂ >21 mrem/hour All Continue work Radiation abo background Investigation on perform thoro monitoring. C a Health Phys Physicist. Organic gases and All	Explosive atmosphere				
Norease monifrequency. Separate Separa			<10% LEL	0 to 1% LEL	Work may continue. Consider toxicity potential.
Ambient Air Concentration			10 to 25% LEL	1 to 10% LEL	Work may continue. Increase monitoring frequency.
Concentration Concentration Concentration Concentration Concentration Concentration Concentration Concentration Concentration Concentration 19.5% O ₂ 19.5% to 23.5% O ₂ Work may concentrate the present of the			>25% LEL	>10% LEL	Work must stop. Ventilate area before returning.
19.5% to 25% O₂ 19.5% to 23.5% O₂ Work may cor Investigate ch₂ 21%. >25% O₂ >23.5% O₂ Work must sto area before re area before re Saiting and the state of the	Oxygen				
Investigate change 21%. >25% O2 >23.5% O2 Work must storate a before recovered Radiation			<19.5% O ₂	<19.5% O ₂	Leave area. Re-enter only with self-contained breathing apparatus.
Radiation Radiation 3 times background to < 1 mR/hour Radiation above background let (normally 0.01 mR/hr) significant radiation source present. Containvestigation with perform thorous monitoring. Cate a Health Phys > 1 mrem/hour Potential radiation source presents investigation of the advice of Physicist.			19.5% to 25% O ₂	19.5% to 23.5% O ₂	Work may continue. Investigate changes from 21%.
3 times background to < 1 mR/hour Radiation abore background let (normally 0.01 mR/hr) signifier radiation source present. Continvestigation with perform thorous monitoring. Can Health Physicist.			>25% O ₂	>23.5% O ₂	Work must stop. Ventilate area before returning.
background le (normally 0.01 mR/hr) signifier radiation source present. Continvestigation we Perform thorous monitoring. Can Health Phys > 1 mrem/hour Potential radiate Evacuate site. investigation of the advice of Health Physicist.	Radiation		< 3 times ba	ackground	Continue work.
Evacuate site. investigation of the advice of Physicist. Organic gases and All			3 times backgroun	nd to < 1 mR/hour	Radiation above background levels (normally 0.01-0.02 mR/hr) signifies possible radiation source(s) present. Continue investigation with caution. Perform thorough monitoring. Consult with a Health Physicist.
			> 1 mrem/hour		Potential radiation hazard. Evacuate site. Continue investigation only upon the advice of Health Physicist.
H		All			
Inorganic gases, vapors, and particulates		All			

4.3 ACTION LEVELS

(Attach action level calculations)

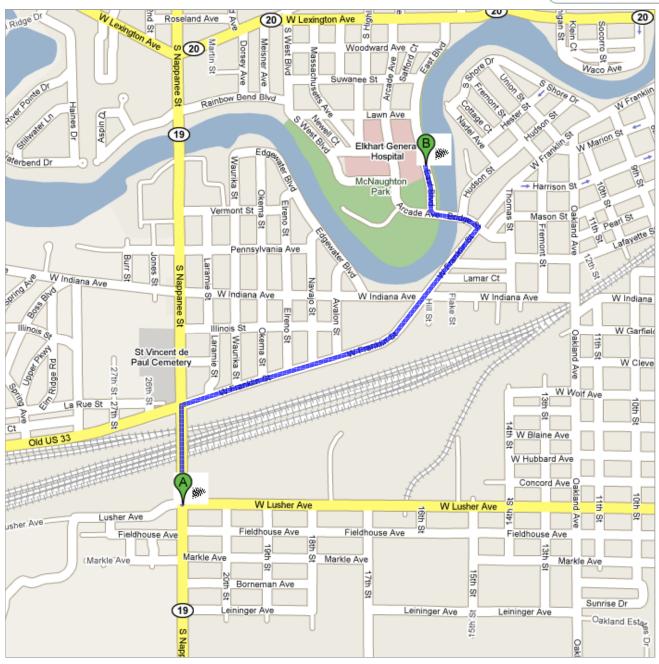
5. HOSPITAL INFORMATION	



Directions to 600 East Blvd, Elkhart, IN 46514

1.3 mi – about **3 mins**



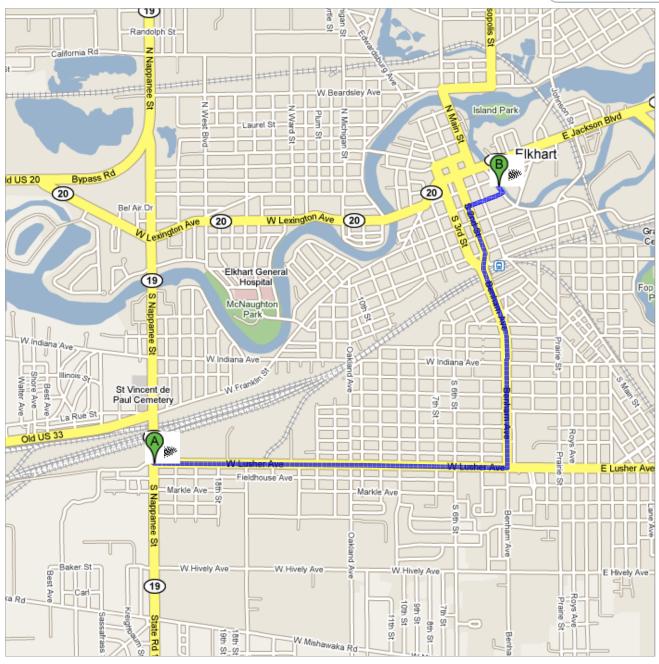




Directions to 175 Waterfall Dr, Elkhart, IN 46516

3.2 mi - about 6 mins







Head east on W Lusher Ave toward 20th St About 3 mins	go 1.7 mi total 1.7 mi
← 2. Turn left at Benham Ave About 2 mins	go 1.1 mi total 2.7 mi
← 3. Slight left at S 2nd St	go 0.2 mi total 3.0 mi
→ 4. Turn right at W High St	go 0.2 mi total 3.2 mi
← 5. Turn left at Waterfall Dr	go 203 ft total 3.2 mi
Elkhart Police Department 175 Waterfall Dr Elkhart, IN 46516	

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

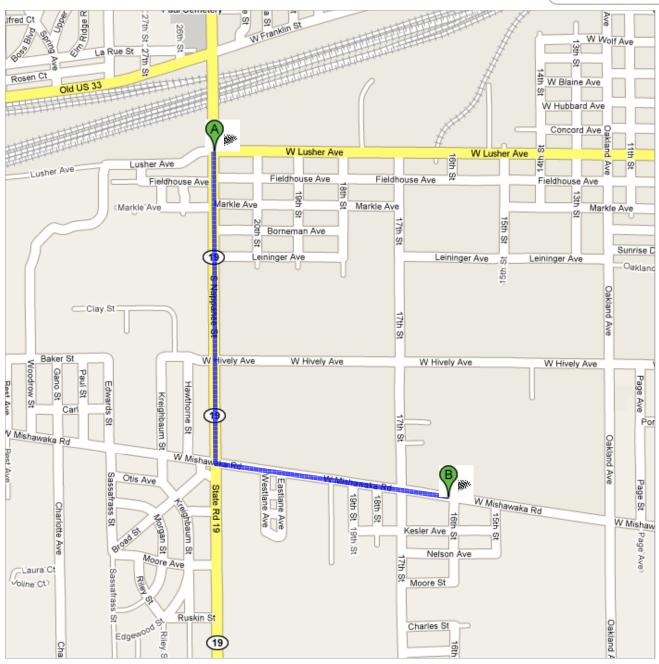
Map data ©2008 Tele Atlas



Directions to 1612 W Mishawaka Rd, Elkhart, IN 46517

1.3 mi - about 3 mins







 Head south on IN-19/S Nappanee St toward Fieldhouse Ave About 2 mins go 0.7 mi total 0.7 mi

← 2. Turn left at W Mishawaka Rd
About 2 mins

go 0.6 mi total 1.3 mi



Elkhart County Fire Department 1612 W Mishawaka Rd Elkhart, IN 46517

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2008 Tele Atlas



1. Head north on IN-19/S Nappanee St	go 0.2 mi total 0.2 mi
→ 2. Turn right at W Franklin St About 3 mins	go 0.9 mi total 1.1 mi
← 3. Turn left at Bridge St	go 0.1 mi total 1.2 mi
→ 4. Turn right at East Blvd	go 0.1 mi total 1.3 mi



These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2008 Tele Atlas

5.1 CONTINGENCIES 5.1.1 Emergency Contacts and Phone Numbers							
Qualisys WESTON Medical Director		Dr. Patrice Marshall		800.874.4676			
Qualisys WESTON Program Administrator		Rosa Diaz		770.541.8792			
After-Business Hours Contact		Dr. Frank Mitchell		404.898.4723			
(In Case of Emergency Only)							
WESTON Corporate Environmental Health & Safety Director		Owen B. Douglass, Jr.		610.701.3065 610.506.5392 (cell)			
WESTON Medical Programs Manager		Carol Tarka		760.603.9910			
WESTON Health & Safety (SOU-D	DIV)						
WESTON Health & Safety (AUSTI	N)						
Fire Department		Elkhart County Fire Department	574	4.522.9811 and/or 911			
Police Department		Elkhart Police Department	574	1.295.7070 and/or			
WESTON FSO Cell Phone		Trenna Seilheimer		260.348.4911			
WESTON PM Cell Phone		Om Patel					
Client Site Phone							
Site Telephone		Trenna Seilheimer		260.348.4911			
Nearest Telephone		Trenna Seilheimer		260.348.4911			
		Local Medical Emergency Facility(s)				
Name of Hospital: Elkhart Gene	eral Hospita	al					
Address: 600 East Boulevard,	Elkhart, IN			Phone No.: 574.294.2621			
Name of Contact: Emergency	Room			Phone No.: 911			
Type of Service:	Route to	Route to Hospital: (See Attached)		Travel time from site:			
Physical trauma only				3 minutes			
☐ Chemical exposure only				Distance to hospital:			
Physical trauma and chemical exposure				1.3 miles Name/no. of 24-hr ambulance service:			
Available 24 hours				911			
	Se	econdary or Specialty Service Prov	ider				
Name of Hospital:							
Address:				Phone No.:			
Name of Contact:				Phone No.:			

Type of Service:	Route to Hospital: (See Attached)	Travel time from site:
Physical trauma only		
☐ Chemical exposure only		Distance to hospital:
Physical trauma and chemical exposure		Name/no. of 24-hr
Available 24 hours		ambulance service:
		/

See reporting an incident in Attachment F.

5.1.2 Hospital Map

Elkhart General Hospital

Start: West Lusher Avenue and South Nappanee Street, Elkhart, IN

Head North on IN-19/South Nappanee Street0.2 milesTurn Right at West Franklin Street0.9 milesTurn Left at Bridge Street0.1 milesTurn Right at East Boulevard0.1 miles

End: Elkhart General Hospital; 600 East Boulevard, Elkhart, IN

Elkhart County Fire Department

Start: West Lusher Avenue and South Nappanee Street, Elkhart, IN

Head South IN-19/South Nappanee Street 0.7 miles
Turn left at West Mishawaka Road 0.6 miles

End: Elkhart County Fire Department; 1612 West Mishawaka Road, Elkhart, IN

Elkhart Police Department

Start: West Lusher Avenue and South Nappanee Street, Elkhart, IN

Head East on West Lusher Avenue1.7 milesTurn Left at Benham Avenue1.1 milesTurn slight Left at South 2nd Street0.2 milesTurn Right at West High Street0.2 milesTurn Left at Waterfall Drive203 feet

End: Elkhart Police Department; 175 Waterfall Drive, Elkhart, IN

5.1 CONTINGENCIES								
5.1.3 Response Plans								
Medical - General Provide first aid, if trained; assess and determine need for further medical assistance. Transport or arrange for transport after appropriate decontamination.		First Aid Kit: Yes No Blood Borne Pathogens Kit: Yes No	Type Standard 20-man and infection control kit	Location In Vehicle	Special First-Aid Procedures: Cyanides on-site Yes No If yes, contact LMF. Do they have antidote kit? Yes No			
		Eyewash required Yes No	Туре	Location	HF on-site Yes No If yes, need neutralizing ointment for first- aid kit. Contact LMF.			
		Shower required Yes No	Туре	Location				
Plan for Response to Spill/Release		Plan for Response to Fire/Explosion		Fire Extinguishers				
In the event of a spill or release, ensure safety, assess situation, and perform containment and control measures, as appropriate. Description of Spill Response Gear	a. Cleanup per MSDSs if small; or sound alarm, call for assistance, notify Emergency Coordinator b. Evacuate to predetermined safe place c. Account for personnel d. Determine if team can respond safely e. Mobilize per Site Spill Response Plan Location	In the event of a fire or explosion, ensure personal safety, assess situation, and perform containment and control measures, as appropriate: Description (Other Fire Re	b. Evacuate predeterm place c. Account for d. Use fire example only if safe in its use e. Stand by the emergency of material conditions	ance, notify cy Coordinator to nined safe or personnel extinguisher e and trained to inform cy responders als and	Type/Location ABC/Vehicle / / / / / / / / Location			
	prior to drilling. Have signed		te.					
Ask person(s) to leave. Avoid confrontation. Call police department @ 911.								



6.1 GENERAL DECONTAMINATION PLAN					
Personnel Decontamination					
Consistent with the levels of protection required, step-by-step procedures for personnel decontamination for each level of protection are attached.					
Levels of Brotestian Denvined for Decentarying tion Decentary					
Levels of Protection Required for Decontamination Personnel					
The levels of protection required for personnel assisting with decontamination will be:					
Level B Modifications include: Level C Level C					
Disposition of Decontamination Wastes					
Provide a description of waste disposition including identification of storage area, hauler, and final disposal site, if applicable					
All waste material generated will be placed in appropriate containers and stored on site for eventual disposal					
Equipment Decontamination					
A procedure for decontamination steps required for non-sampling equipment and heavy machinery follows:					
Equipment will be steam cleaned, pressure washed, or wiped clean as appropriate on decon pad.					
Sampling Equipment Decontamination					
Sampling equipment will be decontaminated in accordance with the following procedure:					
All non-dedicated sampling equipment (probes etc.) will be steam cleaned, pressure cleaned, or washed with an Alconox solution and rinsed with potable water.					

6.2 LEVEL D DECONTAMINATION PLAN					
Check indicated functions or add steps, as necessary:					
Function Description of Process, Solution, and Container					
Segregated equipment drop					
Boot cover and glove wash					
Boot cover and glove rinse					
Tape removal - outer glove and boot					
Boot cover removal					
☑Outer glove removal Place in bag or drum					
HOTLINE					
Suit/safety boot wash					
Suit/boot/glove rinse					
Safety boot removal					
☐Suit removal					
☐Inner glove wash					
☐Inner glove rinse					
☐Inner glove removal					
Inner clothing removal					
CONTAMINATION REDUCTION ZONE (CRZ)/SAFE ZONE BOUNDARY					
☑Field wash Wash hands with soap and water					
Redress					
Disposal Plan, End of Day:					
All waste material generated will be place in appropriate containers and stored on site for eventual disposal.					
Disposal Plan, End of Week:					
All waste material generated will be place in appropriate containers and stored on site for eventual disposal.					
Disposal Plan, End of Project:					
All waste material generated will be place in appropriate containers and stored on site for eventual disposal.					

7.	TRAINING A	AND BRIEFI	NG TOPICS	/SIGN OFF S	SHEET

7.1 TRAINING AND BRIEFING TOPICS				
The following items will be covered at the site-specific training meeting, daily or periodically.				
Site characterization and analysis, Sec. 3.0, 29 CFR 1910.120 I	Level A			
Physical hazards, HASP Form 07	Level B			
Chemical hazards, HASP Form 04	Level C			
Animal bites, stings, and poisonous plants	Level D			
Etiologic (infectious) agents	Monitoring, 29 CFR 1910.120 (h)			
Site control, 29 CFR 1910.120 d	Decontamination, 29 CFR 1910.120 (k)			
Engineering controls and work practices, 29 CFR 1910.120 (g)	Emergency response, 29 CFR 1910.120 (I)			
Heavy machinery	Elements of an emergency response, 29 CFR 1910.120 (I)			
Forklift	Procedures for handling site emergency incidents, 29 CFR 1910.120 (I)			
Backhoe	Off-site emergency response, 29 CFR 1910.120 (I)			
Equipment	Handling drums and containers, 29 CFR 1910.120 (j)			
Tools	Opening drums and containers			
Ladder, 29 CFR 1910.27 (d)/29 CFR 1926	Electrical material handling equipment			
Overhead and underground utilities	Radioactive waste			
Scaffolds	Shock-sensitive waste			
Structural integrity	Laboratory waste packs			
Unguarded openings - wall, floor, ceilings	Sampling drums and containers			
Pressurized air cylinders	Shipping and transport, 49 CFR 172.101, IATA			
Personal protective equipment, 29 CFR 1910.120 (g); 29 CFR 1910.134	Tank and vault procedures			
Respiratory protection, 29 CFR 1910.120 (g); ANSI Z88.2	Illumination, 29 CFR 1910.120 (m)			
Working over water FLD-19	Sanitation, 29 CFR 1910.120 (n)			
Boating safety FLD-18				
Heat Stress				
Proper lifting techniques				

Site Name: Lusher Street WO#: 20405.012.008.0506.00 Address: Elkhart, Elkhart County, Indiana I understand, agree to, and will conform with the information set forth in this Health and Safety Plan (and attachments) and discussed in the personnel health and safety briefing(s). Signature Name Date

7.2 HEALTH AND SAFETY PLAN APPROVAL/SIGNOFF FORM

ATTACHMENT A CHEMICAL CONTAMINANTS DATA SHEETS

(Attach NIOSH)





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NIOSH Pocket Guide to Chemical Hazards

NPG Home Introduction Synonyms & Trade Names Chemical Names CAS Numbers RTECS Numbers Appendices Search				
Methyl chloroform			CAS 71-55-6	
CH ₃ CCI ₃			RTECS KJ2975000	
Synonyms & Trade Names Chlorothene; 1,1,1-Trichloroethane; 1,1,1-Trichloroethane (stabilized)		DOT ID & Guide 2831 160		
Exposure Limits NIOSH REL: C 350 ppm (1900 mg/m³) [15-minute] See Appendix C (Chloroethanes) OSHA PEL†: TWA 350 ppm (1900 mg/m³)			endix C (Chloroethanes)	
IDLH 700 ppm See: 71556				
Physical Description Colorless liquid with a mild, chloroform-like odor.				
	1			

MW: 133.4	BP: 165°F	FRZ: -23°F	Sol: 0.4%
VP: 100 mmHg	IP: 11.00 eV		Sp.Gr: 1.34
Fl.P: ?	UEL: 12.5%	LEL: 7.5%	

Combustible Liquid, but burns with difficulty.

Incompatibilities & Reactivities

Strong caustics; strong oxidizers; chemically-active metals such as zinc, aluminum, magnesium powders, sodium & potassium; water [Note: Reacts slowly with water to form hydrochloric acid.]

Measurement Methods

NIOSH <u>1003</u>

See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection codes)

Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: No recommendation

First Aid (See procedures)

Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH/OSHA

Up to 700 ppm:

(APF = 10) Any supplied-air respirator*

(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin; headache, lassitude (weakness, exhaustion), central nervous system depression, poor equilibrium; dermatitis; cardiac arrhythmias; liver damage

Target Organs Eyes, skin, central nervous system, cardiovascular system, liver

See also: INTRODUCTION See ICSC CARD: 0079 See MEDICAL TESTS: 0141

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NIOSH Pocket Guide to Chemical Hazards

NPG Home Introduction Synonyms & Trade Names Chemical Names CAS Numbers RTECS Numbers Appendices Search			
Tetrachloroethylene	CAS 127-18-4		
CI ₂ C=CCI ₂			
Synonyms & Trade Names Perchlorethylene, Perchloroethylene, Perk, Tetrachlorethylene DOT ID & Guide 1897 160			

Exposure Limits

NIOSH REL: Ca Minimize workplace exposure concentrations. See Appendix A

OSHA PEL†: †: TWA 100 ppm

C 200 ppm (for 5 minutes in any 3-hour period), with a maximum peak of 300 ppm

IDLH Ca [150 ppm] See: 127184 **Conversion** 1 ppm = 6.78 mg/m^3

Physical Description

Colorless liquid with a mild, chloroform-like odor.

MW: 165.8	BP: 250°F	FRZ: -2°F	Sol: 0.02%
VP: 14 mmHg	IP: 9.32 eV		Sp.Gr: 1.62
FI.P: NA	UEL: NA	LEL: NA	

Noncombustible Liquid, but decomposes in a fire to hydrogen chloride and phosgene.

Incompatibilities & Reactivities

Strong oxidizers; chemically-active metals such as lithium, beryllium & barium; caustic soda; sodium hydroxide; potash

Measurement Methods

NIOSH 1003; OSHA 1001 See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection codes)

Skin: Prevent skin contact Eves: Prevent eve contact Wash skin: When contaminated Remove: When wet or contaminated

Change: No recommendation Provide: Eyewash, Quick drench First Aid (See procedures)

Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately

Respirator Recommendations NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure

mode in combination with an auxiliary self-contained positive-pressure breathing apparatus Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus Important additional information about respirator selection

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, liver, kidneys, central nervous system

Cancer Site [in animals: liver tumors]

See also: INTRODUCTION See ICSC CARD: 0076 See MEDICAL TESTS: 0179

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NIOSH Pocket Guide to Chemical Hazards

NPG Home Introduction Synonyms & Trade Names Chemical Names CAS Numbers RTECS Numbers Appendices Search		
Trichloroethylene	CAS 79-01-6	
CICH=CCI ₂	RTECS KX4550000	
Synonyms & Trade Names	DOT ID & Guide	

Ethylene trichloride, TCE, Trichloroethene, Trilene 1710 160

NIOSH REL: Ca See Appendix A See Appendix C **Exposure** Limits OSHA PEL†: TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours)

IDLH Ca [1000 ppm] See: 79016 **Conversion** 1 ppm = 5.37 mg/m^3

Physical Description

Colorless liquid (unless dyed blue) with a chloroform-like odor.

MW: 131.4	BP: 189°F	FRZ: -99°F	Sol(77°F): 0.1%
VP: 58 mmHg	IP: 9.45 eV		Sp.Gr: 1.46
FI.P: ?	UEL(77°F): 10.5%	LEL(77°F): 8%	

Combustible Liquid, but burns with difficulty.

Incompatibilities & Reactivities

Strong caustics & alkalis; chemically-active metals (such as barium, lithium, sodium, magnesium, titanium & beryllium)

Measurement Methods

NIOSH <u>1022</u>, <u>3800</u>; OSHA <u>1001</u> See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection codes)

Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: No recommendation Provide: Eyewash, Quick drench

First Aid (See procedures)

Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately

Respirator Recommendations NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positivepressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any

appropriate escape-type, self-contained breathing apparatus Important additional information about respirator selection

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system

Cancer Site [in animals: liver & kidney cancer]

See also: INTRODUCTION See ICSC CARD: 0081 See MEDICAL TESTS: 0236

ATTACHMENT B MATERIAL SAFETY DATA SHEETS

(Attach MSDSs)

MSDS Number: **T4914** * * * * * Effective Date: **07/06/06** * * * * * Supercedes: **02/16/06**



From: Mallinckrodt Baker, Inc. 222 Red School Lane Phillipsburg, NJ 08865



24 Hour Emergency Telephone: 908-859-2151

CHEMTREC: 1-800-424-9300

National Response in Canada CANUTEC: 613-996-6666

Outside U.S. And Canada Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

1,1,1-TRICHLOROETHANE

1. Product Identification

Synonyms: Methyl chloroform; trichloroethane; chloroetene

CAS No.: 71-55-6

Molecular Weight: 133.40 Chemical Formula: CH3CC13

Product Codes: 9435, 9437, W509, W510

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Methyl Chloroform	71-55-6	96 - 100%	Yes
Dioxane	123-91-1	< 3%	Yes
1,2-Epoxybutane	106-88-7	< 0.5%	Yes
Actual concentrations proprietary			

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER, KIDNEYS, AND CARDIOVASCULAR SYSTEM. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. POSSIBLE CANCER HAZARD. CONTAINS DIOXANE WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA. Risk of cancer depends on duration and level of exposure.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Cancer Causing)

Flammability Rating: 1 - Slight Reactivity Rating: 1 - Slight Contact Rating: 2 - Moderate

Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES

Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:

Inhalation of vapors will irritate the respiratory tract. Affects the central nervous system. Symptoms include headache, dizziness, weakness, nausea. Higher levels of exposure (> 5000 ppm) can cause irregular heart beat, kidney and liver damage, fall in blood pressure, unconsciousness and even death.

Ingestion:

Harmful if swallowed. Symptoms similar to inhalation will occur along with nausea, vomiting. Aspiration of material into the lungs can cause chemical pneumonitis which can be fatal. If aspirated, may be rapidly absorbed through the lungs and result in injury to other body systems.

Skin Contact:

Causes mild irritation and redness, especially on prolonged contact. Repeated contact may cause drying or flaking of the skin.

Eye Contact:

Liquids and vapors cause irritation. Symptoms include tearing, redness, stinging, swelling.

Chronic Exposure:

Prolonged or repeated skin contact may cause dermatitis. Chronic exposure may affect the kidneys and liver. Dioxane is a suspected human carcinogen based on animal data.

Aggravation of Pre-existing Conditions:

Personnel with CNS, kidney, liver or heart disease may be more susceptible to the effects of this substance. Use of alcoholic beverages may aggravate symptoms.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion:

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Call a physician.

Eve Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Autoignition temperature: 500C (932F)

Flammable limits in air % by volume:

lel: 7.0; uel: 16.0

Vapors in containers can explode if subjected to high energy source.

Dioxane has a flash point below 16C (60F).

Explosion:

Can react with strong caustic, such as potash to form a flammable or explosive material. Air/vapor mixtures may explode when heated. Vapors can flow along surfaces to distant ignition source and flash back. Sealed containers may rupture when heated.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Combustion by-products include phosgene and hydrogen chloride gases. Structural firefighters' clothing provides only limited protection to the combustion products of this material.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! Do not use aluminum, magnesium or zinc metal for storage container. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Do not use aluminum equipment or storage containers. Contact with aluminum parts in a pressurized fluid system may cause violent reactions.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

-OSHA Permissible Exposure Limit (PEL):

350 ppm (TWA) for trichloroethane

100 ppm (TWA) skin for dioxane

-ACGIH Threshold Limit Value (TLV):

350 ppm (TWA), 450 ppm (STEL) for trichloroethane

20 ppm (TWA) skin, A3 - Animal Carcinogen for dioxane

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH

document, Industrial Ventilation, A Manual of Recommended Practices, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134). This substance has questionable warning properties. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Viton is a recommended material for personal protective equipment.

Eve Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Clear, colorless liquid.

Odor:

Mild chloroform-like odor.

Solubility:

4,400 ppm in water @ 20C (68F)

Specific Gravity:

1.34 @ 20C/4C

pH:

No information found.

% Volatiles by volume @ 21C (70F):

100

Boiling Point:

74C (165F)

Melting Point:

-32C (-26F)

Vapor Density (Air=1):

4.63

Vapor Pressure (mm Hg):

100 @ 20C (68F)

Evaporation Rate (BuAc=1):

12.8

10. Stability and Reactivity

Stability:

Requires inhibitor content to prevent corrosion of metals. Slowly hydrolyzes in water to form hydrochloric and acetic acid.

Hazardous Decomposition Products:

May produce carbon monoxide, carbon dioxide, hydrogen chloride and phosgene when heated to decomposition. Carbon dioxide and carbon monoxide may form when heated to decomposition.

Hazardous Polymerization:

Hazardous polymerization can occur in contact with aluminum trichloride.

Incompatibilities:

Open flames, welding arcs, nitrogen tetroxide, oxygen, liquid oxygen, sodium, sodium hydroxide, and

sodium-potassium alloy, strong alkalis, oxidizers, aluminum and other reactive metals.

Conditions to Avoid:

Insufficient inhibitor, incompatibles, heat, flame and ignition sources

11. Toxicological Information

Oral rat LD50: 9600 mg/kg; inhalation rat LC50: 18000 ppm/4H; investigated as a mutagen, tumorigen, reproductive effector; irritation eye rabbit, Standard Draize, 2mg/24H severe.

\Cancer Lists\			
To sure dia cont		Carcinogen	TADO Cabacca
Ingredient	Known	Anticipated	IARC Category
Methyl Chloroform (71-55-6)	No	No	3
Dioxane (123-91-1)	No	Yes	2B
1,2-Epoxybutane (106-88-7)	No	No	2B

12. Ecological Information

Environmental Fate:

When released into the soil, this material is not expected to biodegrade. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released to water, this material is expected to quickly evaporate. This material is not expected to significantly bioaccumulate. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition. When released to the atmosphere, this material has an average global half-life of 6.0 - 6.9 years. When released into the air, this material may adversely affect the ozone layer.

Environmental Toxicity:

This material is expected to be slightly toxic to aquatic life. The LC50/96-hour values for fish are between 10 and 100 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: 1,1,1-TRICHLOROETHANE

Hazard Class: 6.1 UN/NA: UN2831 Packing Group: III

15. Regulatory Information

\Chemical Inventory Status - Ingredient		TSCA	EC	Japan	Australia
Methyl Chloroform (71-55-6)			Yes	Yes	Yes
Dioxane (123-91-1)		Yes	Yes	Yes	Yes
1,2-Epoxybutane (106-88-7)		Yes	Yes	Yes	Yes
\Chemical Inventory Status	- Part 2\				
- 11 .				anada	
Ingredient				NDSI	Phil.
Methyl Chloroform (71-55-6)			Yes	No	Yes
Dioxane (123-91-1)		Yes	Yes	No	Yes
1,2-Epoxybutane (106-88-7)		Yes	Yes	No	Yes
\Federal, State & Internation					A 313
Ingredient	RQ				emical Cate
Methyl Chloroform (71-55-6)	No			 S	No
Dioxane (123-91-1)	No	No	Ye	s	No
1,2-Epoxybutane (106-88-7)	No	No	Ye	S	No
\Federal, State & Internation	onal Regulat	ions -	Part	2\	
				Т	
Ingredient		LA		3 8	` '
 Methyl Chloroform (71-55-6)			U226		 Io
Dioxane (123-91-1)	100		U108	N	ГО
1,2-Epoxybutane (106-88-7)	100		No	N	ГО
emical Weapons Convention: No TRA 311/312: Acute: Yes Chronic					
activity: No (Mixture / Lic		- 110 E	ressu.	LC. IVO	

WARNING:

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: 2[Z]

Poison Schedule: S6

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 2 Flammability: 1 Reactivity: 0

Label Hazard Warning:

WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER, KIDNEYS, AND CARDIOVASCULAR SYSTEM. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. POSSIBLE CANCER HAZARD.

CONTAINS DIOXANE WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA. Risk of cancer depends on duration and level of exposure.

Label Precautions:

Avoid breathing vapor.

Keep container closed.

Use only with adequate ventilation.

Wash thoroughly after handling.

Avoid contact with eyes, skin and clothing.

Label First Aid:

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases call a physician.

Product Use:

Laboratory Reagent.

Revision Information:

No Changes.

Disclaimer:

Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

Prepared by: Environmental Health & Safety Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **T0767** * * * * * Effective Date: **05/19/08** * * * * * Supercedes: **08/16/05**



From: Mallinckrodt Baker, Inc. 222 Red School Lane Phillipsburg, NJ 08865





24 Hour Emergency Telephone: 908-859-2151

CHEMTREC: 1-800-424-9300

National Response in Canada CANUTEC: 613-996-6666

Outside U.S. and Canada Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance

TETRACHLOROETHYLENE

1. Product Identification

Synonyms: ethylene tetrachloride; tetrachloroethene; perchloroethylene; carbon bichloride; carbon dichloride

CAS No.: 127-18-4

Molecular Weight: 165.83 Chemical Formula: C12C:CC12

Product Codes:

J.T. Baker: 9218, 9360, 9453, 9465, 9469

Mallinckrodt: 1933, 8058

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Tetrachloroethylene	127-18-4	99 - 100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer depends on level and duration of exposure.

SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate (Poison) Flammability Rating: 0 - None Reactivity Rating: 1 - Slight Contact Rating: 2 - Moderate (Life)

Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES

Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:

Irritating to the upper respiratory tract. Giddiness, headache, intoxication, nausea and vomiting may follow the inhalation of large amounts while massive amounts can cause breathing arrest, liver and kidney damage, and death. Concentrations of 600 ppm and more can affect the central nervous system after a few minutes.

Ingestion:

Not highly toxic by this route because of low water solubility. Used as an oral dosage for hookworm (1 to 4 ml). Causes abdominal pain, nausea, diarrhea, headache, and dizziness.

Skin Contact:

Causes irritation to skin. Symptoms include redness, itching, and pain. May be absorbed through the skin with possible systemic effects.

Eve Contact:

Causes irritation, redness, and pain.

Chronic Exposure:

May cause liver, kidney or central nervous system damage after repeated or prolonged exposures. Suspected cancer risk from animal studies.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye problems or impaired liver or kidney function may be more susceptible to the effects of the substance. The use of alcoholic beverages enhances the toxic effects.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion:

Aspiration hazard. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

Wash skin with soap or mild detergent and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Call a physician.

Eve Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:

Do not administer adrenaline or epinephrine to a victim of chlorinated solvent poisoning.

5. Fire Fighting Measures

Fire:

Not considered to be a fire hazard but becomes hazardous in a fire situation because of vapor generation and possible degradation to phosgene (highly toxic) and hydrogen chloride (corrosive). Vapors are heavier than air and collect in low-lying areas.

Explosion:

Not considered to be an explosion hazard. Containers may explode when involved in a fire.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire. Water spray may be used to keep fire exposed containers cool.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Store in a cool, dry, ventilated area away from sources of heat or ignition. Isolate from flammable materials. Protect from direct sunlight. Wear special protective equipment (Sec. 8) for maintenance break-in or where exposures may exceed established exposure levels. Wash hands, face, forearms and neck when exiting restricted areas. Shower, dispose of outer clothing, change to clean garments at the end of the day. Avoid cross-contamination of street clothes. Wash hands before eating and do not eat, drink, or smoke in workplace. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

-OSHA Permissible Exposure Limit (PEL): 100 ppm (TWA), 200 ppm (ceiling), 300 ppm/5min/3-hour (max)

-ACGIH Threshold Limit Value (TLV):

25 ppm (TWA), 100 ppm (STEL); listed as A3, animal carcinogen

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation*, *A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eve Protection:

Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Clear, colorless liquid.

Odor:

Ethereal odor.

Solubility:

0.015 g in 100 g of water.

Specific Gravity:

1.62 @ 20C/4C

pH:

No information found.

% Volatiles by volume @ 21C (70F):

100

Boiling Point:

121C (250F)

Melting Point:

-19C (-2F)

Vapor Density (Air=1):

5.7

Vapor Pressure (mm Hg):

18 @ 25C (77F)

Evaporation Rate (BuAc=1):

0.33 (trichloroethylene = 1)

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage. Slowly decomposed by light. Deteriorates rapidly in warm, moist climates.

Hazardous Decomposition Products:

Carbon dioxide and carbon monoxide may form when heated to decomposition. Hydrogen chloride gas and phosgene gas may be formed upon heating. Decomposes with moisture to yield trichloroacetic acid and hydrochloric acid.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Strong acids, strong oxidizers, strong alkalis, especially NaOH, KOH; finely divided metals, especially zinc, barium, lithium. Slowly corrodes aluminum, iron and zinc.

Conditions to Avoid:

Moisture, light, heat and incompatibles.

11. Toxicological Information

Oral rat LD50: 2629 mg/kg; inhalation rat LC50: 4100 ppm/6H; investigated as a tumorigen, mutagen, reproductive effector.

12. Ecological Information

Environmental Fate:

When released into the soil, this material is expected to quickly evaporate. When released into the soil, this material may leach into groundwater. When released into the soil, this material may biodegrade to a moderate extent. When released to water, this material is expected to quickly evaporate. When released into water, this material is not expected to biodegrade. This material is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals.

Environmental Toxicity:

The LC50/96-hour values for fish are between 1 and 10 mg/l. The LC50/96-hour values for fish are between 10 and 100 mg/l. This material is expected to be toxic to aquatic life.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: TETRACHLOROETHYLENE

Hazard Class: 6.1 UN/NA: UN1897 Packing Group: III

Information reported for product/size: 4L

International (Water, I.M.O.)

Proper Shipping Name: TETRACHLOROETHYLENE

Hazard Class: 6.1 UN/NA: UN1897 Packing Group: III

Information reported for product/size: 4L

International (Air, I.C.A.O.)

Proper Shipping Name: TETRACHLOROETHYLENE

Hazard Class: 6.1 UN/NA: UN1897 Packing Group: III

Information reported for product/size: 4L

15. Regulatory Information

\Chemical Inventory Status - Part 1	\				
Ingredient		TSCA	EC	Japan	Australia
Tetrachloroethylene (127-18-4)					Yes
\Chemical Inventory Status - Part 2	\				
Ingredient			DSL		Phil.
Tetrachloroethylene (127-18-4)				No	
\Federal, State & International Reg					 A 313
	RQ	TPQ	Lis	st Che	mical Catg.
				5	
\Federal, State & International Reg	ulatio			2\ T	
=	CERCLA	A	261.33	3 8	(d)
				N	
Chemical Weapons Convention: No TSCA 12(1 SARA 311/312: Acute: Yes Chronic: Yes : Reactivity: No (Pure / Liquid)					

WARNING:

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: 2[Z] Poison Schedule: None allocated.

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 2 Flammability: 0 Reactivity: 0

Label Hazard Warning:

WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of

cancer depends on level and duration of exposure.

Label Precautions:

Do not get in eyes, on skin, or on clothing.

Do not breathe vapor or mist.

Keep container closed.

Use only with adequate ventilation.

Wash thoroughly after handling.

Label First Aid:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases call a physician.

Product Use:

Laboratory Reagent.

Revision Information:

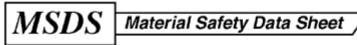
No Changes.

Disclaimer:

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Prepared by: Environmental Health & Safety Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **T4940** * * * * * Effective Date: 12/06/07 * * * * * Supercedes: 08/01/05



From: Mallinckrodt Baker, Inc. 222 Red School Lane Phillipsburg, NJ 08865





24 Hour Emergency Telephone: 908-859-2151

CHEMTREC: 1-800-424-9300

National Response in Canada CANUTEC: 613-996-6666

Outside U.S. and Canada Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

TRICHLOROETHYLENE

1. Product Identification

Synonyms: Trichloroethene; TCE; acetylene trichloride; Ethinyl trichloride

CAS No.: 79-01-6

Molecular Weight: 131.39 **Chemical Formula:** C2HCl3

Product Codes:

J.T. Baker: 5376, 9454, 9458, 9464, 9473

Mallinckrodt: 8600, 8633

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Trichloroethylene	79-01-6	100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED OR INHALED. AFFECTS HEART, CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. CAUSES SEVERE SKIN IRRITATION. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer depends on level and duration of exposure.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate (Poison) Flammability Rating: 1 - Slight Reactivity Rating: 1 - Slight Contact Rating: 3 - Severe

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:

Vapors can irritate the respiratory tract. Causes depression of the central nervous system with symptoms of visual disturbances and mental confusion, incoordination, headache, nausea, euphoria, and dizziness. Inhalation of high concentrations could cause unconsciousness, heart effects, liver effects, kidney effects, and death.

Ingestion:

Cases irritation to gastrointestinal tract. May also cause effects similar to inhalation. May cause coughing, abdominal pain, diarrhea, dizziness, pulmonary edema, unconsciousness. Kidney failure can result in severe cases. Estimated fatal dose is 3-5 ml/kg.

Skin Contact:

Cause irritation, redness and pain. Can cause blistering. Continued skin contact has a defatting action and can produce rough, dry, red skin resulting in secondary infection.

Eye Contact:

Vapors may cause severe irritation with redness and pain. Splashes may cause eye damage.

Chronic Exposure:

Chronic exposures may cause liver, kidney, central nervous system, and peripheral nervous system effects. Workers chronically exposed may exhibit central nervous system depression, intolerance to alcohol, and increased cardiac output. This material is linked to mutagenic effects in humans. This material is also a suspect carcinogen.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders, cardiovascular disorders, impaired liver or kidney or respiratory function, or central or peripheral nervous system disorders may be more susceptible to the effects of the substance.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion:

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician.

Skin Contact:

Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eve Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:

Do not administer adrenaline or epinephrine to a victim of chlorinated solvent poisoning.

5. Fire Fighting Measures

Fire:

Autoignition temperature: 420C (788F) Flammable limits in air % by volume:

lel: 8; uel: 12.5 **Explosion:**

A strong ignition source, e. g., a welding torch, can produce ignition. Sealed containers may rupture when heated.

Fire Extinguishing Media:

Use water spray to keep fire exposed containers cool. If substance does ignite, use CO2, dry chemical or foam.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Combustion by-products include phosgene and hydrogen chloride gases. Structural firefighters' clothing provides only limited protection to the combustion products of this material.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

Trichloroethylene:

-OSHA Permissible Exposure Limit (PEL):

100 ppm (TWA), 200 ppm (Ceiling),

300 ppm/5min/2hr (Max)

-ACGIH Threshold Limit Value (TLV):

10 ppm (TWA) 25 ppm (STEL); A2 Suspected Human Carcinogen.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the

contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation*, *A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134). This substance has poor warning properties. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Neoprene is a recommended material for personal protective equipment.

Eve Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Clear, colorless liquid.

Odor:

Chloroform-like odor.

Solubility:

Practically insoluble in water. Readily miscible in organic solvents.

Specific Gravity:

1.47 @ 20C/4C

pH:

No information found.

% Volatiles by volume @ 21C (70F):

100

Boiling Point:

87C (189F)

Melting Point:

-73C (-99F)

Vapor Density (Air=1):

4.5

Vapor Pressure (mm Hg):

57.8 @ 20C (68F)

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage. Will slowly decompose to hydrochloric acid when exposed to light and moisture.

Hazardous Decomposition Products:

May produce carbon monoxide, carbon dioxide, hydrogen chloride and phosgene when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Strong caustics and alkalis, strong oxidizers, chemically active metals, such as barium, lithium, sodium, magnesium, titanium and beryllium, liquid oxygen.

Conditions to Avoid:

Heat, flame, ignition sources, light, moisture, incompatibles

11. Toxicological Information

Toxicological Data:

Trichloroethylene: Oral rat LD50: 5650 mg/kg; investigated as a tumorigen, mutagen, reproductive effector.

Reproductive Toxicity:

This material has been linked to mutagenic effects in humans.

\Cancer Lists\			
	NTP	Carcinogen	
Ingredient	Known	Anticipated	IARC Category
Trichloroethylene (79-01-6)	No	Yes	2A

12. Ecological Information

Environmental Fate:

When released into the soil, this material may leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released to water, this material is expected to quickly evaporate. This material has an experimentally-determined bioconcentration factor (BCF) of less than 100. This material is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life between 1 and 10 days.

Environmental Toxicity:

The LC50/96-hour values for fish are between 10 and 100 mg/l. This material is expected to be slightly toxic to aquatic life.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: TRICHLOROETHYLENE

Hazard Class: 6.1 UN/NA: UN1710 Packing Group: III

Information reported for product/size: 4L

International (Water, I.M.O.)

Proper Shipping Name: TRICHLOROETHYLENE

Hazard Class: 6.1 UN/NA: UN1710 Packing Group: III

Information reported for product/size: 4L

15. Regulatory Information

\Chemical Inventory Status - Part 1\ Ingredient	TSCA	EC	Japan	Australia
				Yes
\Chemical Inventory Status - Part 2\			 anada	
Ingredient		a DSL	NDSL	Phil.
Trichloroethylene (79-01-6)			No	
\Federal, State & International Regulat -SAR				 A 313
Ingredient RQ				mical Catg.
	No			
\Federal, State & International Regulat	cions -			
Ingredient CERC		261.33		(d)
Chemical Weapons Convention: No TSCA 12(b): SARA 311/312: Acute: Yes Chronic: Yes Fire Reactivity: No (Pure / Liquid)				

WARNING:

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: None allocated.

Poison Schedule: S6

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 2 Flammability: 1 Reactivity: 0

Label Hazard Warning:

WARNING! HARMFUL IF SWALLOWED OR INHALED. AFFECTS HEART, CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. CAUSES SEVERE SKIN IRRITATION. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of

cancer depends on level and duration of exposure.

Label Precautions:

Do not get in eyes, on skin, or on clothing.

Do not breathe vapor.

Keep container closed.

Use only with adequate ventilation.

Wash thoroughly after handling.

Keep away from heat and flame.

Label First Aid:

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases call a physician. Note to physician: Do not administer adrenaline or epinephrine to a victim of chlorinated solvent poisoning.

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 8.

Disclaimer:

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Prepared by: Environmental Health & Safety Phone Number: (314) 654-1600 (U.S.A.)

ATTACHMENT C SAFETY PROCEDURES/FIELD OPERATING PROCEDURES

(Attach FLD OPs)

ATTACHMENT D HAZARD COMMUNICATION PROGRAM

SITE-SPECIFIC HAZARD COMMUNICATION PROGRAM

Location-Specific Hazard Communication Program/Checklist

To ensure an understanding of and compliance with the Hazard Communication Standard, WESTON will use this checklist/document (or similar document) in conjunction with the WESTON Written Hazard Communication Program as a means of meeting site- or location-specific requirements.

While responsibility for activities within this document reference the WESTON Safety Officer (SO), it is the responsibility of all personnel to effect compliance. Responsibilities under various conditions can be found within the WESTON Written Hazard Communication Program.

To ensure that information about the dangers of all hazardous chemicals used by WESTON are known by all affected employees, the following Hazard Communication Program has been established. All affected personnel will participate in the Hazard Communication Program. This written program, as well as WESTON's Corporate Hazard Communication Program, will be available for review by any employee, employee representative, representative of OSHA, NIOSH, or any affected employer/employee on a multi-employer site.

\boxtimes	Site or other location name/addres	s: Lusher Street	
\boxtimes	Site/Project/Location Manager:	Om Patel	
\boxtimes	Site/Location Safety Officer:	renna Seilheimer	
\boxtimes	List of chemicals compiled, format:		
\boxtimes	Location of MSDS files: <u>H</u>	IASP	
	Training conducted by: Name:		Date:
	Indicate format of training docume	ntation: Field Log: Other:	
	Client briefing conducted regarding	hazard communication:	
	If multi-employer site (client, subco	ntractor, agency, etc.), indicate name of affe	ected companies:
	Other employer(s) notified of chem	icals, labeling, and MSDS information:	
	Has WESTON been notified of oth necessary? ☐ Yes ☐ No	er employer's or client's hazard communica	ion program(s), as

List of Hazardous Chemicals

A list of known hazardous chemicals used by WESTON personnel must be prepared and attached to this document or placed in a centrally identified location with the MSDSs. Further information on each chemical may be obtained by reviewing the appropriate MSDS. The list will be arranged to enable cross-reference with the MSDS file and the label on the container. The SO or Location Manager is responsible for ensuring the chemical listing remains up-to-date.

Container Labeling

The WESTON SO will verify that all containers received from the chemical manufacturer, importer, or distributor for use on-site are clearly labeled.

The SO is responsible for ensuring that labels are placed where required and for comparing MSDSs and other information with label information to ensure correctness.

Material Safety Data Sheets (MSDSs)

The SO is responsible for establishing and monitoring WESTON's MSDS program for the location. The SO will ensure that procedures are developed to obtain the necessary MSDSs and will review incoming MSDSs for new or significant health and safety information. He/she will see that any new information is passed on to the affected employees. If an MSDS is not received at the time of initial shipment, the SO will call the manufacturer and have an MSDS delivered for that product in accordance with the requirements of WESTON's Written Hazard Communication Program.

A log for, and copies of, MSDSs for all hazardous chemicals in use will be kept in the MSDS folder at a location known to all site workers. MSDSs will be readily available to all employees during each work shift. If an MSDS is not available, immediately contact the WESTON SO or the designated alternate. When a revised MSDS is received, the SO will immediately replace the old MSDS.

Employee Training and Information

The SO is responsible for the WESTON site-specific personnel training program. The SO will ensure that all program elements specified below are supplied to all affected employees.

At the time of initial assignment for employees to the work site, or whenever a new hazard is introduced into the work area, employees will attend a health and safety meeting or briefing that includes the information indicated below.

- Hazardous chemicals present at the work site.
- Physical and health risks of the hazardous chemicals.
- The signs and symptoms of overexposure.
- Procedures to follow if employees are overexposed to hazardous chemicals.
- Location of the MSDS file and Written Hazard Communication Program.
- How to determine the presence or release of hazardous chemicals in the employee's work area.
- How to read labels and review MSDSs to obtain hazard information.
- Steps WESTON has taken to reduce or prevent exposure to hazardous chemicals.
- How to reduce or prevent exposure to hazardous chemicals through the use of controls procedures, work
 practices, and personal protective equipment.
- Hazardous, nonroutine tasks to be performed (if any).
- Chemicals within unlabeled piping (if any).

Hazardous Nonroutine Tasks

When employees are required to perform hazardous nonroutine tasks, the affected employee(s) will be given information by the SO about the hazardous chemicals he or she may use during such activity. This information will include specific chemical hazards, protective and safety measures the employee can use, and steps WESTON is using to reduce the hazards. These steps include, but are not limited to, ventilation, respirators, presence of another employee, and emergency procedures.

Chemicals in Unlabeled Pipes

Work activities may be performed by employees in areas where chemicals are transferred through unlabeled pipes. Prior to starting work in these areas, the employee will contact the SO, at which time information as to the chemical(s) in the pipes, potential hazards of the chemicals or the process involved, and the safety precautions that should be taken will be determined and presented.

Multi-Employer Work Sites

It is the responsibility of the SO to provide other employers with information about hazardous chemicals imported by WESTON to which their employees may be exposed, along with suggested safety precautions. It is also the responsibility of the SO and the Site Manager to obtain information about hazardous chemicals used by other employers to which WESTON employees may be exposed. WESTON's chemical listing will be made available to other employers, as requested. MSDSs will be available for viewing, as necessary.

The location, format, and/or procedures for accessing MSDS information must be relayed to affected employees.

ATTACHMENT E AIR SAMPLING DATA SHEETS

		SI	TE AIR MO	ONITORIN	G PROGR	AM			
			Fie	eld Data She	eets				
Location:					OM: Chia	ald Drobo/			
				Aerosol	GM: Shield Probe/ Thin Window				
% LEL	% O ₂	PID (units)	FID (units)	Monitor (mg/m³)	mR/hr	срт	Nal (uR/hr)	ZnS (cpm)	
							<u> </u>		
	Monit	tox (ppm)			D	etector Tube((s)		
Sound Lev	els (dBA)	Illumination	рН	Other	Other	Other	Other	Other	
			•						
Location:	<u> </u>	<u>'</u>			l		l .		
				Aerosol Monitor		eld Probe/ Vindow	Nal	ZnS	
% LEL	% O ₂	PID (units)	FID (units)	(mg/m³)	mR/hr	cpm	(uR/hr)	(cpm)	
/0 LLL	70 02	T ID (units)	TID (units)	(1119/111)	IIIIVIII	Сріп	(divin)	(сріп)	
	Monit	tox (ppm)		Detector Tube(s)					
Sound Lev	els (dBA)	Illumination	рН	Other	Other	Other	Other	Other	

AIR MONITORING/SAMPLING DATA LOG								
Client:			W.O. No).:		Samp	ole No.:	
Address:			Sample	Sampled By: D				
	I	Employee a	nd Locati	ion Info	rmation			
Employee Name:		En	nployee N	0.:		Job Title:		
Respirator	PR	Full Face] Hood] Hood] Safety Sho		acturer:	☐ Other		dge Type:
			`a	Dete				
Compling Type:	☐ Personal		ampling	Data		Dumm Ti	ma/Caria	ıl Nıo -
Sampling Type: TWA STE Full Shift Part	Media:				Pump Ty	/pe/Seria	ii NO.:	
Calibrator/Serial No.:		Pre-Ca	libration:			Post-Cal	ibration:	
/		1. 2. 3. avg-pre	э :			1. 2. 3. avg-post	t:	
Start Time:	Restart Time:		tart Time:	art Time: Avg. Flow			%	Change:
1 st Stop Time:	2 nd Stop Time:	3 rd Stop Time: Total Ti			Total Tir	ne:	Vo	olume:
Multiple Samples for ☐ Yes ☐ No	this TWA:	Multiple Che				Exposure T		Worst Case
		Sam	pling Cor	nditions	3			
Weather Conditions:	Temp:	R.H:		3.P.:		Other:		
Engineering Controls								
		Subs	tances E	valuate	d			
Substance	Result	Substan	ce	Resu	lt	Substa	nce	Result
Observations and Comments								

QA by:

ATTACHMENT F INCIDENT REPORTING

NOTIFICATION OF INCIDENT—INITIAL REPORT

The NOI form should be utilized to report ALL incidents. Incidents include: employee accidents, injuries, auto accidents, property damage/loss, information /data breaches, security concerns, subcontractor injuries/accidents/events, *OR other liability situations or circumstances that could give rise to a claim.* The NOI form is intended to be a preliminary summary (<u>due within 24 hours/one business day</u>) reporting what is immediately known of an event or situation. After a NOI report is released, and the appropriate resources within the organization are notified, an investigation should be initiated.

Manag	ger, and	Susan Hip	p-Ludw	ick, Corpo		nager.	If incident is	related	lliam Irwin, Corpo to information /c	
SECT	<u>ION 1</u> : S	ECURITY	INCIDE	NT SUMMA	ARY (PROCEED	TO ITEN	1#1 BELOW)			
□тн	EFT	☐ VAND	ALISM	☐ THRE	AT / ASSAULT	. [] COMPUTERS	3	☐ OTHER	
email free EH&S and the President employments	to Susan , the Dire ne Divisio dent; Ala oyee if su	Hipp-Lud ect Superv on EH&S M n Solow, C ich persor	wick and risor of t Manager COO; Ra n is not t	d Matthew he involve . Distribut y Griffin, S he person	Dillon in Risk ed employee(s tion of safety r Senior VP of H	Manage), the Selated R; the ne NOI	gement, and . Safety Officer, incidents sho appropriate Di	Ower the Clie uld also ivision	ctor. Submit written Douglass of Colent Service Manago include: Pat Mc Manager(s), and it to the distribution	rporate ger (CSM), cCann, involved
writing team r	j, and ser members	nt by email	to Susar ter, and o	Hipp-Lud	dwick and Mat	t Dillor	n in the Risk Ma	anagem	a claim are to be r ent, and appropria nclude Owen Doug	te project
	<u>ion I:</u> in Jury/Il	ICIDENT S	AUT		SUBCONTRAC	TOR	☐ ENVIRON		L OTHER (e.g. property loss or circumstance the rise to a claim)	
1. DA	TE / TIMI	E /LOCATI	ON OF I	NCIDENT	(Project, Office	, or Oth	ner location. Inc	lude W	O#):	
2. EM	IPLOYEE	(S) / INDIV	/IDUAL(S	S) INVOLV	ED or WITNES	S TO I	NCIDENT / EVI	ENT:		
JC	OB TITLE	/ ROLE:			DI\	/./ PRC	FIT CENTER /	ORG.	UNIT	
3. DIF	RECT SU	PERVISO	R / AND	OFFICE M	ANAGER OR F	PROJE	CT MANAGER	(Whom	never is Appropriate	e):
4. DI\	/ISION / I	LOCAL SA	FETY O	FFICER (if	f applicable):					
5. DE	SCRIPTI	ON OF INC	CIDENT	POTENTI	IAL LIABILITY I	EXPOS	SURE/EVENT A	ND RE	SULTING INJURY	/ DAMAGES

6. WERE AUTHORITIES CONTACTED (police, government)? IF YES, IDENTIFY (i.e., agency name, case number, etc).

S	SECTION II: INJURY/IES	
7.	. TREATING PHYSICIAN NAME, HOSPITAL, if Applicable:	
8.	. CAN PERSONNEL RETURN TO WORK?	ESTRICTIONS, IF KNOWN :
	SECTION III: IF VEHICLE OR EQUIPMENT INVOLVED	
9.	. EQUIPMENT / VEHICLE INFORMATION (Year / Make / Mo	odel): VIN:
	OWNED RENTED ALLOWANCE PERSON	ALLY OWNED VEHICLE
FO	OR ADDITIONAL INFORMATION, CONTACT (Name and Phor	ne Number):

This is preliminary information, subject to change, and may contain errors. Any errors in this report will be corrected as follow-up investigation is conducted.

Investigative Reports and/or other documentation will often be necessary supplemental information supporting initial NOI report.

Questions can be directed to Susan Hipp-Ludwick at 610.701.3046 or Matt Dillon at 610.701.7413

ATTACHMENT G AHA CHECKLIST AND ENV. COMPLIANCE

HAZARD CHECKLIST Site Manager/EHS Officer: Date:					Task Team (name or reference via daily sign-in sheet)					
	Location: Address:									
	ZARDS IDENTIFIED (chec	k the	ose applicable)							
	Chemical		Biologic	al		Physical		Aerial lifts		Remote Areas
	Flammable/combustible		Insects			Noise		Man. Material Handling		Materials handling
	Corrosive		Animals			Heat		Demolition		High Pressure Washers
	Oxidizer		Plants			Cold		Excavation		Hand and Power Tools
	Reactive		Mold/Fungus			Inclement Weather		Pile Driving		Low Illumination
	Toxic		Viral/Bacterial			Hot Work		Welding/Cutting/Burn		Drilling & Boring
	Inhalation		Density Gauges			Confined Spaces		Hot Surfaces		Striking against/Struck-by
	Eyes/Skin		Radiological			Stored hazardous Energy		Hot Materials		Caught-in/Caught between
	Pesticides		Ultra-Violet			Elevation		Rough Terrain		Pushing/pulling
	Carcinogen		Sunlight			Utilities		Compressed Gases		Falls at same level
	Asbestos		Infrared			Machinery		Hazardous Mat. Storage		Falls from elevation
	Lead		Lasers			Mobile equipment		Diving		Repetitive motion
	UXO/OE/ CWM		XRF			Cranes		Operation of Boats		High (>110v) Electricity
	Process Safety		Isotopes			Manual Material Handling		Working Over Water		Slippery surface Ice/Snow
	Applying Paint/Coatings		,			Ladders		Traffic		
	,					Scaffolding		Site Security		
RE	QUIRED PROTECTION (cl	neck	those applicable	le)			•			
	Ţ		Administra							
	Engineering Controls		Contro			F	PPE			Contingency
	Guard Rails		Qualified for task			Air Supplying Respirator		Tyvek coveralls		Emergency Signal Known
	Machine Guards		Trained/Certified			Air Purifying Respirator		Coated Coveralls		Eye wash/shower Location
	Sound Barriers		Hot Work Permit			SCBA		Welding leathers		First Aid Kit Location
	Enclosure		CSE Permit			Hard Hat		CWM		Fire Extinguisher Location
	Elevation		Lockout/Tag Out			Ear Plugs		Safety Shoes/Boots		Spill Kit Location
	Isolation		Work Permit			Ear Muffs		Rubber Boots		Severe weather shelter
	GFCI		Dig Safe Permit			Safety Glasses		Gloves		Evacuation Routes
	Assured Ground Program		Contingency Plan			Goggles		Cooling Suits		
	Apply Anti-slip/skid Mat		Critical Lift Plans			Chemical Goggles		Ice Vests		
			Equip. Inspection S	Sheets		Face Shield		Radiant heat Suits		
						Thermal Shield		Fall Arrest		
						Welding Mask		PFD		
						Cutting Glasses		Electrical insulation		
Any	Modification to Tasks (list)			Other tasks or	acti	vities that may affect my activity		Reasons for any changes i	ndicat	ed above

Environmental Compliance Considerations:

Generation of Hazardous Waste*	→Waste Identification & Manifesting - Marking, Placarding, Labeling
Generation of Investigation Derived Waste*	→Training & Licensing for Use of Radioactive Materials/Sources
Treatment, Storage, or Disposal of Hazardous Waste*	→ Containers: dated, labeled, closed, full, stored less than 90 days
Contingency to prevent or contain hazardous materials or oil spills or discharges to drains, body of water, soil*	→ Risk of explosion or catastrophic release due to chemical storage or processing involving reactivity, flammables, solvents or explosives
Disturbing of Asbestos Containing Materials (ACM)*	→Training & Licensing for Asbestos Remediation Activities
Application of Pesticides or Herbicides*	
Work on Above or Under-ground Storage Tanks*	
Transportation, Storage or Disposal of Radioactive Material*	
Activities producing or generating Air Emissions (or fugitive "fence-line" emissions) requiring either monitoring and/or permit*	
Excavations, Drilling, Probing or other activities that could impact underground utilities, pipelines, sewer or treatment systems.	
Shipment of Hazardous Waste off-site* Shipment of Samples in accordance with DOT/IATA	

^{*} Indicates need for an environmental compliance plan.

ATTACHMENT H TRAFFIC CONTROL PLAN

ATTACHMENT I AUDIT FORMS

MANAGER'S FIELD SITE HEATLH AND SAFETY AUDIT FORM PM name: _____ W.O. No.: Client name: Site location: ____ Site phone no.: Inspection conducted by: PM via phone (Contact Name: __ PM in person PM's designee (Designee's Name: _____) 1. Is the HASP available at the site? __yes __no Signed by all personnel? __yes __no (Have the cover page and site worker sign-off page faxed and attached to this form.) What tasks are active? 3. What special H&S considerations are necessary? (e.g., confined spaces, fall protection, construction safety, excavation evaluations, radiation, etc.) 4A.List the name of the FSO on Line (a) and any other employees working at the site on lines (b) through (i). Verify and check (✓) if field certifications are current: Name Weston or Training Medical Fit Test Sub? C. d. e. f. g. 4B.For large projects, is documentation on-site for employee certifications? yes no NA

5. Is emergency contact information available on-site?

(Have a copy faxed from the site and attached to this report.)

Describe the ambient temperatures during recent work shifts: _______.

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__yes __no

7.	Was the level of PPE used for each task today as required by the HASP?yesno
8A	. What contaminant monitoring is conducted?
8B	. How are results documented?LogbookFormsother (describe): (Have the most recent results and calibration information faxed and attached to this form.)
9.	What other monitoring is done? (e.g., heat stress, cold, noise, etc.)
10.	How are work zones marked and/or designated?
11.	Are personnel and equipment decon performed as required by the HASP?yesno
12.	Are first aid and CPR services provided as required by the HASP?yesno
13.	When were first aid kits, BBP kits, and fire extinguishers last inspected? (Have documentation faxed and attached to this form.)
14.	Was site-specific hazard communication completed and properly documented?yesno (Have checklist in HASP Attachment D faxed and attached to this form.)
15.	When was the last safety briefing conducted? List topic(s) discussed:
	(Have minutes/sign-up sheet faxed and attached to this form.)
16.	Explain any negative findings below:
PM	1 Signature/Date:

HEALTH AND SAFETY FIELD AUDIT

Legend X = Yes, O = No

SITE NAME:
WO #:
LOCATION:
INSPECTOR:
DATE:
CERTIFICATION OF PERSONNEL:
 All WESTON personnel on site are currently active on certification list? Site Safety Officer and Site Supervisor are qualified?
MEDICAL AND FIRST AID:
 First Aid Kits accessible and identified? Emergency eye/safety washes available? Daily First Aid logs up to date? First Aid Kits inspected weekly? At least two First Aid trained persons on site at all times when working?
SITE SAFETY/EMERGENCY PLANS:
 Safety plan posted on site and given to each person? Initial site safety plan meeting held and documented before work begins? Hazardous materials information available for all hazards? Designated, qualified site health and safety coordinator on site? Employees trained in toxicology/exposure risks? Emergency telephone numbers posted? Emergency routes designated? Emergency plan and signal reviewed with all persons?
TRAINING:
 Daily safety meetings documented? Question and answer time available to all site personnel? All employees instructed in hazardous materials handling practices? New personnel to site receive: copy of safety plan, site orientation, Review of:

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PERSONAL PROTECTION:

1	All equipment meets ANSI/OSHA/EPA criteria?
2	Levels of protection (LOP) established?
3	Site control zones (Exclusion, CRZ, Support) clearly designated?
4	All employees know their LOP scheme?
5	OSHA respirator program in place?
6	Employees fit tested for respirators?
	On site?
	Fit tests current?
7	Defective equipment tagged out?
8	Breathing air grade "D" certified?
	Sufficient quantities of equipment?
10	Safety instrumentation maintained and calibrated?
	Maint. & Cal. logs up to date?
DEC	ONTAMINATION:
1	Decon system set up on site?
	Used?
	According to safety plan?
2	Contamination reduction corridor clearly delineated within the CRZ?
3	Appropriate waste recepticals available for all waste?
4	Recepticals properly closed at end of day?
5	All Decon liquids properly contained and disposed of?
6	All wastes disposed of according to approved plan?
7	All personnel received Decon training?
	All reusable personal protective gear deconned and disinfected at least daily?
FIRE	PREVENTION/PROTECTION:
	Hot work permits required?
	Smoking restricted to designated area?
	Fire lanes established, clearly designated & maintained?
4	Flammable/combustible liquid dispensing transfer systems grounded & bonded?
5	Proper flammable materials storage?
6	Fire alarm established, workers aware?
7	Location and use of fire extinguisher known by all personnel?
8	Fire extinguishers checked before each shift?
	Inspected monthly?
9	Fire extinguisher appropriate for fire hazard potential?
10.	Combustible materials segregated from ignition sources?

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WALKING AND WORKING SURFACES:

1	_Accessways, stairs, ramps and ladders free of ice, mud, snow or debris?
2	Ladders exceed max length?
3	Ladders used in passageways, doors or driveways?
4	_Broken or damaged ladders tagged out?
5	_Metal ladders prohibited in electrical service?
6	_Safety feet on straight and extension ladders?
7	_Stairways, floor and wall openings guarded?
8	_Elevated work areas guardrailed or safety chained?
9	_Flotation devices worn when working on or over water?
10	_Toe boards on overhead work surfaces?
11	_Mobile offices/labs have fixed stairs and handrails?
12	_Work areas kept free of debris and equipment?

EXCAVATIONS, CONFINED SPACES, TUNNELS:

1	_Excavations sloped, shored or benched to prevent cave-ins?
2	_Shoring approved by engineer?
3	_Guardrails or fences placed around excavations near walkways or roads?
4	_Excavation locations lighted/or otherwise made visible at night?
5	_Utility check performed and documented before excavation or drilling?
6	_Ladders available in trenches more than 4 feet deep and at a minimum, 25' intervals along a fence?
7	_All excavated material, personnel, heavy equipment is at least 24" from the edge of all trenches?
8	Confined space entry permit procedure in place and communicated to all?
9	_Employee training includes CSE hazards?
10	_Tunnels are adequately ventilated?
11	_There is proper lighting?
12	_Tunnel tested for: % O₂?
-	_LEL, flammable gases, vapors?
	_TOX?
13	_Communication available inside to out?
14	_No flammables or combustibles in tunnel?
15	_CSE procedures used for Tunnels?
16	_CSE procedure checklist:
	Safety watch?
	Safety watch protected same as enterers?
	Safety line?
	Appropriate harness?
	Continuous monitoring for % O ₂ , % LEL & TOX?

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EXCA	VATIONS, CONFINED SPACES, TUNNELS (continued):
	Level B or constant ventilation and monitoring? Instruments calibrated? Maintain and inspect log for all equipment?
17	Confined space isolated from electrical/mechanical activation by following lock out/tag out proceedings? Confined space isolated from any raw materials/chemical lines by disconnecting or blanking these lines?
мот	OR VEHICLES/HEAVY EQUIPMENT:
2 3 4 5 6 7 8 9 SLIN 0	Inspected before each use? Operators licensed for equipment used? Unsafe equipment tagged out and reported? All safety appliances/guards in place? Shut down for fueling? Equipped with back-up alarms or spotter used if 360° visibility restricted? Loads are secure before transport? Roads and structures inspected for load capacity per vehicle weights? Riders prohibited on heavy equipment? GS AND CHAINS: Slings, chains and rigging rated for intended use and inspected per OSHA. Documentation of inspection in daily log? Damaged slings, chains or rigging tagged out and reported? Employees are instructed and keep clear of suspended loads?
ELEC	TRICAL:
1	Warning signs indicate the presence and location of high voltage equipment, 250 V or greater present and location?
3	Electrical equipment and wiring properly guarded? Electrical lines, extension cords and cables guarded and properly maintained?
5	Extension cords kept dry out of puddles and rain? Damaged equipment tagged out?
	 Underground electrical lines located and indicated? Overhead electrical lines de-energized or elevated work platforms, work areas, booms or ladders erected so no contact can occur with electrical lines?
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HAND AND POWER TOOLS:

1	Guards and safety devices in place and used?
2	Inspected before each use?
3	lagged out if defective?
4.	Eye protection areas identified and protection worn?
5	Non sparking tools available?
WEL	DING AND CUTTING:
1	Fire extinguishers present at all welding and cutting operations?
2	Confined spaces, tanks, pipelines tested before welding or cutting?
3	Hot work permitting system in use?
4	Proper helmets and shields (including proper tint for UV protection) used?
5	Properly grounded?
6	$_{}$ Fuel gas and ${\sf O}_2$ gas cylinders stored at least 20' apart?
	Stored upright and secured?
7	Only trained welders permitted?
СОМ	PRESSED GAS CYLINDERS/PRESSURIZED LINES:
1	Breathing air cylinders charged only to prescribed pressure?
	No other gas system can be mistaken for breathing air?
	Fittings prohibit cross connection?
3	Cylinders segregated appropriately in controlled, protected but well ventilated areas?
4	Smoking prohibited in storage areas?
5.	Cylinders stored upright and secured?
6	Cylinder caps in place when stored (not in use) or when cylinders moved? Fuel gas and O₂ minimum 20' apart when stored? Pressurized air or waterlines are securely connected?
7	Fuel gas and O₂ minimum 20' apart when stored?
8	Pressurized air or waterlines are securely connected?
9	All site personnel know never to step across a pressurized line?
10	Gas or other hazardous lines are labelled appropriately?
MISC	ELLANEOUS:
1	Tools and other equipment (portable) are stored away from walkways, roads or driveways where
	they cannot fall on or be fallen over by site personnel?
2	Overhead hazards are noted, communicated to all and labeled as needed?
3	Hard hat, eye hearing and protection areas are defined and signs in place?
4	Hard hats, eye and head protection used where appropriate?
5	Signs or labels are in place or appropriate training received?

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6	Copies of contracts with client and sub-contractors are on-site, WESTON's role regarding si safety responsibilities clear in these and in the minds of the site manager(s)?	te health and	
7	Sub-contractors have received approved copies of their safety plan or have signified their intent to conform with Weston's safety plan?		
8	Site managers understand their responsibilities for sub-contractors' conformance with all OS health and safety requirements?	SHA and other	
9	Site managers know what to do in the event of an OSHA inspection?		
COM	MENTS:		